REPORT

OF THE

PROCEEDINGS

OF THE

TWELFTH ANNUAL BLISTER RUST CONFERENCE

HELD IN

ALBANY, NEW YORK, DECEMBER 9-10, 1926.

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PROGRAM

TWELFTH ANNUAL BLISTER RUST CONTROL CONFERENCE

Room 250, State Capitol, Albany, N. Y. December 9 and 10, 1926

Thursday, December 9 - 9:30 a.m.

Address of Welcome.....Mr. C. R. Pettis, Supt. of Forests, New York State Conservation Commission.

1. Public speaking in blister rust control work..Mr. G.E. Peabody, Instructor in Extension, Cornell University.

2. Reporting blister rust news.....Prof. Bristow Adams, Editor of Publications, Cornell University.

3. The blister rust control agent extends himself..Mr. J. A. Cope, Extension Forester, New York State.

2:00 p.m.

4. Progress of blister rust control work in the Eastern States.....Mr. E. C. Filler, Federal Supervisor.

5. General discussion of field problems, augmented by brief special papers:

Blister rust exhibits.....Mr. C. E. Baker, Agent

Getting out Ribes by scouting, and two and three man eradication methods.....Mr. S. D. Conner, Agent

Effective supervision of eradication work...Mr. T. J. King "

Office procedure (records and maps).....Mr. G. S. Doore "

Blister rust and the younger generation.....Mr. S. V. Holden "

6:30 p.m.

Dinner.....Grill Room, Hampton Hotel. - Dr. Haven Metcalf, toastmaster.
Talks - Motion pictures - Informal get-together.

Friday, December 10 - 9:30 a.m.

6. Whys and wherefores of submarginal farm lands...Mr. L.M. Vaughn, Instructor, Farm Management, N.Y. State College of Agriculture.

7. Forest management by private owners in the Adirondacks..Prof. A.B. Recknagel, N.Y. State College of Agriculture.

8. The office and the field man....Mr. W. P. Cox, Bureau of Plant Industry.

1:30 p.m.

9. Practical lessons from blister rust history.....Dr. L. H. Pennington, N.Y. State College of Forestry.

10. Blister rust situation in Europe.....Dr. Perley Spaulding, Northeastern Forest Experiment Station.

11. Pests or patience.....Dr. H. H. York, Conservation Commission.

12. Field investigations in blister rust control.....Mr. E. W. Littlefield, Conservation Commission.

13. Experimental work at North Hudson, N. Y. Mr. A. E. Fivaz, Agent.

14. Scientific investigations..Dr. Haven Metcalf, Office of Forest Pathology.

15. Closing remarks.....Mr. S. B. Detwiler, Pathologist in Charge, Office of Blister Rust Control.

(Time will be allowed for thorough discussion of the subjects on the program and such additional topics as desired.)

ADDRESS OF WELCOME

By C. R. Pettis,
Superintendent of Forests, New York Conservation Commission

On account of pressure of official duties, it was impossible for either Governor Smith or Commissioner Macdonald, of the Conservation Commission, to welcome the Twelfth Annual Blister Rust Conference.

After discovery of blister rust in 1909, a meeting was called by this Commission in New York City to discuss the problem. As far as I know, Mr. Filley of Connecticut and myself were the only ones in attendance at that meeting in 1909 who are present today.

In 1916 we had 30,000,000 white pine seedlings and transplants in our nurseries. It was a real problem to decide a policy regarding future plantations and blister rust control. 30,000,000 is a large number of trees. A question was raised as to their disposal, their productive value, and our future plan. The policy was to play safe, and therefore the sowing of white pine seed in the New York Conservation Commission's nurseries was suspended during 1916 and 1917.

At a meeting of the Blister Rust Conference in Boston on Armistice Day in 1918, the pathologists told us it was safe to plant white pine with a protective strip of 900 feet. Therefore, after a two-year suspension of planting in New York State, we had confidence in the pathologists in regard to these control measures and went ahead and bought seed and resumed our prior planting program.

These meetings have been successful. They have been a means of contact and discussion not only among the few who may be responsible for the work but as a medium of educating and bringing into contact the fellows who are out in the field and who have to get their feet on the sandy land that produces the

pine, and my every wish is that this meeting will be as conducive of the spirit of contact and education as have those in the past.

PAPERS

on

EDUCATIONAL ACTIVITIES

PUBLIC SPEAKING IN BLISTER RUST CONTROL WORK

By G. E. Peabody,
Instructor in Extension, Cornell University

Up until a few years ago, the training in public speaking was all for such professions as politics, the law, the ministry, and for entertainment. There was no special training for men doing the type of work you are doing. At Cornell we have tried to meet this need and are giving a course for extension work.

Apparently the only requirement for specialist work has been that the specialist be thoroughly trained in subject matter. The ability to interpret this subject matter has only too seldom been made a requirement. Not everyone can become an orator, but anyone with ordinary intelligence can become an effective speaker, and with attention to a few simple rules and practice can put his ideas across.

Most specialists think that the only important thing in a speech is - what is said. This is important, but what is more important is - what the audience gets.

Preparation of material

1. Determine objective or aim.

2. Analyze material -

Don't try to make more than two or three major points in any one speech. You can not tell all you know in an hour. If you could, the audience has some rights. It can not be expected to find out all you know in an hour. If it can, you are in the wrong business.

Prepare a good introduction. The introduction should get attention and state the objective.

Then prepare a good outline.

Keep up to date on material.

Use local illustrations first.

Be careful in use of illustrated material (charts, maps, etc.). Never use charts that are not perfectly legible to most of your audience. If too small, they are of no use.

Use concrete language and simple terms.

Use of humor: A dangerous weapon - effective if well handled. Effective against speaker if not. Nothing will spoil talk more than a story that has fallen flat. Use stories from own observation.

Human interest important thing.

Know material.

Delivery of Speech:

Most important thing is to talk to audience, not at them. Develop conversational style - study audience - watch reaction. Try to overcome mannerisms. Speakers getting away from exaggerated formal gestures. Use simple, natural gestures, if you want to.

Posture: Very important. Take it easy - don't be stiff - don't be uneasy.

Voice: Let voice out. Don't have to shout. Don't be afraid you are going to speak too loud.

Discussion after talk:

In answering questions, get question clearly and restate it. Answer to whole group.

Remedy for questioners who are trying to get your goat - "Can't quite get you; will you please rise and state your name." This is very effective if put over in the right way. Speaker has legitimate right to treat them that way.

Plain licorice good for throat trouble.

Use of illustrated material:

Know your charts and talk to audience. Face audience. In giving lantern slide and motion picture talks, give outline of important things, before talk. The audience should be prepared for what they are to see in the pictures.

Remember

Have something to say, say it, and quit.

Discussion

Mr. Detwiler: What is meant by "human interest."

Mr. Peabody: Use concrete examples - tell things that interest and affect people.

Dr. York; To what extent should a speaker talk at a slide lecture?

Mr. Peabody: Give brief outline before talk - avoid monotony - know your slides. Good thing to talk while slides are being shown.

Mr. Pierce: Would you recommend distributing something that the audience can take with them? If so, when should they get it?

Mr. Peabody: Yes, but it should not be given out before talk, as it detracts attention.

Mr. Newman: Would it be advisable to give résumé before showing a film?

Mr. Peabody: Recommend it before showing slides and motion pictures.

Mr. Cullen: Asks suggestions for effective ending for talk.

Mr. Peabody: Talk should end rather vigorously, and bring out fundamental things you want audience to get.

Mr. C. E. Baker: What would you suggest when speaker has to run his own machine?

Mr. Peabody: Use own judgment - talk to audience before.

Mr. Filley: One of my own faults is talking too fast. It is fatal to hesitate in the middle of a sentence.

REPORTING BLISTER RUST NEWS

By Bristow Adams
Editor of Publications, Cornell University

The public is interested in news which is a plain recital of facts: the public needs facts more than it needs opinions. Editors and educators alike realize that the public is perfectly able to draw sound conclusions if it has the information on which these conclusions may be based. They are equally sure that the ignorance of the public can not be overestimated, and that those who have the facts should present them simply as facts and allow readers to come to their own opinion.

News, therefore, will not be free advertising, but will be an unbiased public report, owed to the public in return for public appropriations made for public benefit. News will not be press-agenting or propaganda, nor should it be expected that the editor will print it because it represents a "good cause". Thousands of good causes are clamoring at the columns of newspapers, and the editor judges what shall go into his columns only on the basis of whether it has news value; for news is what a paper likes to print because it is what the readers want to read. News will never be judged on the basis of what an organization or enterprise would like to have printed.

For the reasons set forth, it should be realized that only when there is news of interest to most of the readers of a paper will it be possible to get space in the paper.

Quality of News

Reducing news to a mathematical formula, it may be said that facts plus names, minus opinion, equals news. The editor likes all

the names he can get, particularly the names of local persons concerned with the news. He doesn't want expressions of opinion except as they may be printed on the authority of a named individual whose statement will have an authenticated news value.

Blister rust news in the main will consist of three kinds:

First and most important are news reports of work which has been done, or of meetings which have been held. In other words, the editor and the readers both approve of accounts of things which have been accomplished, rather than advance notices of things which may come to pass. Second in importance are the announcements of work which is to be done, or results which are to be accomplished or expected. Third in importance are the announcements of meetings which are to be held. Although most individuals connected with public activities are likely to think that the third class is the most important, it is important only in their eyes because these advance notices constitute a method of getting a crowd. It must be remembered that if the editor receives advance notices of meetings and does not receive immediately a record of what is done at those meetings, he will come to the conclusion that the meetings can not be of any great importance, and he will print the advance notices with great reluctance, if at all. For this reason blister-rust agents and others should emphasize the first of the three types of organization news.

How to Write News

Every news item should have as what is known as a news "lead." This will be the most interesting, the most significant, the most odd, or the most important fact in respect to an event or a meeting. The

opening sentence will tell practically all there is about the item. It will blurt out the salient facts without any preliminaries and will answer the four questions: Who? What? When? and Where? Sometimes, though rarely, it may be desirable to answer the question, "Why?" But this may generally be left out, because it is likely to mean the expression of an opinion.

It will thus be seen that the news of a meeting will not read like the minutes of that meeting. Routine events such as the reading of the minutes, the calling of the roll, and the like, have no place in a news item. The most interesting happening should be placed first in a news story even though it happened last. Thus, if a meeting should break up in a riot, that fact, from a news point of view, should be mentioned first even though it was the last thing which happened.

A news item of a meeting is news only in the next succeeding issue of the paper after the meeting. In order to be sure that the item may get in, it is sometime possible to write it in advance and have it in the hands of the paper with a release date for the time of printing immediately after the meeting is over.

Where a man has access to both daily and weekly papers he should make it a point to have a different item for the weekly papers and for the daily papers; that is, all the items for weekly papers may be exactly alike and the items for the daily papers may be exactly alike. But the weekly papers should have the opportunity of printing an item which differs from that in the daily papers so that the readers of the weekly, which appears later, may not think that the weekly has copied an item which has previously appeared in the daily paper.

The news item of a prospective meeting should state plainly when the meeting is to be held, including the day and hour; where it is to be held, including the location of the building and the actual room in that building; why the meeting is held; what is to be done and who are to take part, together with significant facts about the participants. This last does not mean extravagant praise of the individuals, but a record of what those individuals have done to make them notable.

The ABC's

The ABC's of news writing are Accuracy, Brevity, and Clearness.

Accuracy means the exact statement of facts, names, and dates so that there can be no mistake and no confusion.

Brevity means a complete statement which will satisfy all the curiosity of the reader but which will not indulge in any padding.

Clearness is that which makes the meaning impossible to mistake. It is obtained usually by short, plain words and short sentences, with a preference for one-syllable Anglo-Saxon words. This does not mean to write down to the public, but to write up to them in the best diction which is known. The writer will leave out meaningless statements such as "an interesting talk from which all present will profit." Such a statement uses up space and does not say one thing. If facts can not be given from a speaker's talk, it is best just to say that he spoke and to give the title of his subject.

A constant reiteration of facts about blister rust will eventually convert the public and will put the message across. The blister rust agent can well afford to take a leaf from the advertiser's notebook;

his text is exemplified in the verse:

The constant drop of water wears away the hardest stone;
The constant gnaw of Towser will chew up the toughest bone;
The constant, cooing lover carries off the blushing maid;
And the constant advertiser is the one who gets the trade.

Some Elementary Pointers

Write items on a standard-size sheet of paper. Write on one side of the sheet only, beginning the item about three inches from the top of the first page, and leaving space for the editor to write a heading for the article. Do not attempt to write the heading which the editor will use. A single topical caption telling what the item is about may be given for the editor's guidance.

Have the manuscript or "copy" absolutely plain and legible. This means that it will be typewritten, double-space or triple-space, and never single-spaced. If the manuscript is written by hand, write with great care and leave a half-inch space between the lines. In such hand-written copy always print initials and any unusual proper names and never use any abbreviations. With more than one page of manuscript put the word "more" in parenthesis in the lower right-hand corner of each page which is succeeded by another page; at the end of the item write the word "end," or give some other sign that the item is finished.

Get the manuscript to the newspaper at the earliest possible moment. If it is received before the paper is full, the editor is grateful for it; if it is received after the paper is full, the editor is not so much impressed.

If the material is labeled, do not label it "publicity;" label

it "news." The editor does not like publicity; he does like news, and it is just as well to have the manuscript introduced as a hero rather than a villain. Stop as soon as the item is complete and do not attempt an additional sentence "just to round it off."

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Discussion

Mr. Brockway: To what extent would you use numbers?

Prof. Adams: Depends on newspapers - usually all numbers under 20 are written out.

Dr. York: Is it good practice to quote people, and should they be consulted before it is given to the press?

Prof. Adams: You owe it to the man to give him opportunity to see item. Always base items on statements of authorities on subject matter.

Mr. King: Do you think it advisable to run a series of articles, or wait and group them?

Prof. Adams: It is best to run small items rather than waiting and grouping them.

BLISTER RUST DEMONSTRATIONS

By C. E. Baker,
New York Blister Rust Control Agent

I have been asked to give a short paper on "Exhibits," but since we are not authorized to have "exhibits," I have changed this paper to one on Demonstrations, since the agent may have demonstrations.

The field of blister rust demonstrations is so wide that a short paper could scarcely touch upon it, so this paper will be limited to Fair Demonstrations.

What I may say concerning demonstrations does not carry the weight of an authority, as an authority is simply an ordinary man away from home, and I am here in the midst of men of my own acquaintance, men who are more capable of handling this subject than I am. The principal object in this paper is to act as a starting point for a discussion.

To bring a vast group of widely different people to think and act as one would like for them to act is a task of large proportions, and it is only after a great amount of time and labor has been spent that massed ignorance is overcome and the group acts in accordance with the desires of the person in charge of the project. First, before action takes place the group must be led through the successive stages of Attention, Interest, Confidence, Desire, and Decision.

The blister rust agent through some means or other must lead the people in his county or district through all these stages, and for advancing them through the first two, namely, Attention and Interest, the Fair Demonstration has an important place.

Some agents have expressed the idea that the fair demonstrations

were of little value and took the agent's time away from more valuable work. The values coming from a fair demonstration may be hidden for the present and sometimes in the future the agent often finds that their value appears.

The purpose of the fair demonstration is fourfold: To attract attention; to enable the agent to meet a large number of people, largely from the rural communities; to give publicity to your work; and to help the Fair Association make a good showing. If they do just that I feel that the agent has accomplished a great deal. Perhaps no concrete results will appear immediately.

One of the first things to consider about a demonstration is the location. Most fair associations are only too glad to give the agent space for a demonstration if they are approached in ample time before the fair, but if the agent waits until the day before the fair opens to ask for space he will have to take what is left. A location near exhibits of farm products usually gets crowds passing by, because most of the people who attend the fair, whether they live in the city or in the country, usually make one trip through the halls to see the farm products. This year at the Ballston Fair in Saratoga County I had the choice of two locations. One, large and well lighted, was in a hall devoted principally to displays of fancy work; the other, a space between a Jew selling white diamond sharpening stones and a quack selling wonder oils and salves. I chose the latter location because I felt certain that those two fellows would have a crowd around them most of the time. I was careful, however, to wall off the blister rust demonstration from them so that the public would not confuse me with the fakers. There is the danger, though, of having too much competition near your demonstration. One agent's demonstration was placed so near a Punch and Judy show

that he was passed by in the rush to see the Punch and Judy. Now that most fairs are provided with electric lights, the dark location is not such a great handicap, although of course the location well lighted naturally is to be desired.

If a good location can not be secured inside of a building, it is far better to have the demonstration outside in a tent. Mr. Nichols, the agent in Essex County, N.Y., held a very successful demonstration in a tent at the Westport Fair. Inside the tent he had some posters and preserved specimens of rust on pines. The main part of his demonstration was outside the tent, where he planted infected pines of all sizes and also infected Ribes of several species. Red ribbons and arrows showed very plainly the cycle through which blister rust goes.

A good location of itself is not going to get the crowds to come and look your exhibit over. There has to be something that stands out or is unique if the people are deliberately going to seek out your demonstration. Two of the best bets to attract attention are motion and color.

I believe the best drawing card for a demonstration I have seen was an electrically operated manikin who apparently picked placards out of a box and showed them to the crowd, all the time winking and smiling. The cards, some fifteen in number, contained a short history of blister rust and some facts regarding its control. The people crowded around the machine all the time it was in operation, and they stayed to read the entire series of cards. No doubt most of the people who read the cards would have thrown away a bulletin on blister rust if it had been given to them. Some member of a family would see the machine and in a few

minutes we would see them coming back dragging some other member of their family. Once you get the crowds around your demonstration they will usually hang around long enough to see some of the materials you are displaying.

A concealed electric fan blowing strings of yellow paper, attached to Ribes bushes, toward pines also attracts considerable attention. There are any number of ways to get motion into the demonstration. Just get the motion whether it applies directly to your subject or not, and you'll get the crowds.

Live fish or animals are also a good attraction. In several instances local fish and game clubs have exhibited fish and mounted specimens in a booth alongside that of the blister rust agent, and people who came merely to see the fish took a look at what the agent had in his demonstration.

Another means which has been used quite successfully here in New York to attract attention to the demonstration is the guessing contest. The contest was to guess the number of leaves on a large wild gooseberry bush, labeled "The Thousand Dollar Gooseberry Bush." The bush was placed in a very prominent place in the booth, where people passing by could get near the bush very easily. Cards containing "Have You Guessed on the Number of Leaves on the Thousand Dollar Gooseberry Bush in the Blister Rust Exhibit in Floral Hall?" were placed in cars and in all the buildings and stands on the grounds. Three cash prizes for the three best guesses were given, and the news of a chance to make some money on a guessing contest soon spread around and the crowds came to guess and saw something of blister rust before they got away.

Most people come to the fairs to meet old acquaintances, eat popcorn, and be entertained, not to be educated; so in our demonstrations we

have got to entertain them by some means at first and get over some of our other "dope" while we are entertaining them or after we have lured them in by the entertainment. About all you can get out of the average person doing the fair, if they think you are trying to educate them, is "yes" or "uh-huh," while your victim has a far-away look in his eye and his mind is on the horse races.

Do not let the idea of motion or the luring part of the demonstration be the only real thing there. It is merely to get the people there, and the rest of your demonstration must be so attractive that the person looks it over and gets something out of it. Practically the whole appeal is to the eye, and anything which tends to disconcert the eye acts on the person and your ideas fail to go across.

If the person in his first glance sees some old battered and torn posters, some dried-up trees or withered Ribes bushes, he is quite likely to walk past the booth; but if everything is fresh and crisp looking he is very apt to stop. In our demonstrations here in New York we always show some boxes containing forest trees from the State nurseries. I have noticed that they receive more comment after they have been freshly sprinkled and the drops of water are still on the trees, then when the trees are dry and somewhat wilted. All materials should be in good condition.

Next in importance to condition of materials, I think, comes simplicity. Don't try to show several species of Ribes, various stages of blister rust on pines, and a lot of photographs and posters. One idea gotten across is far better than a half dozen hazy pictures, which soon vanish from the mind. We have been criticised here in New York for show-

ing nursery stock along with blister rust, but we find that if we keep it somewhat separated from the blister rust part of the demonstration it serves to attract attention because of its rich green coloring. Simplicity should be given a great deal of consideration, because a maze of material confuses the eye and too many thoughts do not stick in the minds of our crowds, the bulk of whom we are told have the average mentality of a fourteen-year-old child.

The idea of educating the people attending the fairs by means of charts still seems to hang on, and if used sparingly has some value; but it is amusing to take a look at some of the charts in fair exhibits. In one public health booth I counted 28 posters, all printed in small lettering and containing materials evidently taken from a college textbook on nutrition. Not one in a hundred grasped a single thought from those charts. I feel that four or five charts, each carrying one idea in a few words, are a great deal better than a dozen with a whole sermon on each. They should preferably be at a height in the demonstration where the eye falls naturally on them, and should be so conspicuous and plainly lettered that the public can read them at a glance. A pretty good test of the success of your posters is in whether or not the women in passing by read them aloud. To make the few posters stand out very prominently, put some strips of gummed tape around the edge. This is very attractive if the background of the demonstration is light. Posters can either make or ruin a demonstration.

Sometimes attention to details makes a vast difference in a demonstration. Such little things as a poster hanging crooked, a specimen tree or bush about to fall over, or some of the decorating material hanging loose, distracts from the ideas of the demonstration and gives the appearance of

laxity, and a man is judged by his work by most people. One thing in the little things about a demonstration is balance. I have seen some fair demonstrations of blister rust which seemed to me to be about to topple over. All the material was in one end of the booth, and the unbalanced idea attracted too much of the person's attention away from the ideas of the demonstration. The man had the material in this case but had not arranged it properly. Some persons dislike demonstrations but feel that it is part of their duties to put up some kind of a show at the fairs, so they grab up some materials and throw up a demonstration which had better not have been put up at all.

I personally feel that fair demonstrations are a great benefit in the work of blister rust control, and I believe I voice the opinion of the New York agents when I say that. Perhaps we do not make the most of our demonstrations. Some attendants at fair demonstrations will let a man come over to the booth, look things over very carefully, and then watch him walk away. Maybe that man is a pine owner and one word would have started a conversation which would have brought concrete results. At the Saratoga County Fair this past fall, 24 names were secured of persons desiring pine inspections, and some of those persons are "signed up" for eradication next year. They practically came from starting a conversation with someone who looked interested.

Discussion

Mr. McNerney: Disagrees with Baker, and asks how much time Baker spent in putting up exhibit mentioned, where he got 24 names.

Mr. Baker: Took one morning to put it up.

Mr. McNerney: No doubt, many people see exhibit. Majority of people at fairs (his district) come from cities.

Mr. Baker: Some of his best supporters come from cities.

Mr. McNerney: Locations he has been able to obtain for exhibits were not satisfactory.

Mr. Baker: Possibly unusual conditions in McNerney's district. Only averaged 6 cooperators a day, but considered it a pretty good day's work.

Mr. McNerney: No reason why agents can not demonstrate in owner's back yard. They are more interested then. Exhibits at fairs expensive and not worth while in his estimation.

Mr. Baker: Contacts not only value derived from fair exhibits.

Mr. Bradder: Agrees with Baker. Made many contacts with owners from other districts besides his own. Cooperates in this way with other agents in State.

Mr. Detwiler: Subject especially interesting, and would like to get opinion of agents, by vote.

Mr. Filler: Asks Holden to tell of his Ford exhibit at Champlain Valley fair.

Mr. Holden: Has Ford truck with exhibit - fresh specimens, posters, etc., which he drives to suitable location on grounds. Got over 40 names in two days at this fair (men of all positions). Believes good fair exhibit is excellent way to make contacts.

Mr. Richardson: Has found exhibits beneficial in aiding town appropriations.

Mr. Conner: Believes we should continue with fair exhibits, or outside people will think blister rust is dying out.

Mr. King: Several thousand dollars of town cooperation in New Hampshire has resulted from fair exhibits.

Mr. Cullen: At Rochester, N. H. fair, the Governor and State senator saw blister rust for the first time. Many prominent men interviewed at fairs.

Mr. Brockway: Believes conditions vary in different States.

Result of Vote by Agents:

In favor---------30
Against----------4 (All Massachusetts men)

Dr. York: Expense involved in setting up exhibit is far less than if agent were to take time in field to search out each individual. People are usually in right mood to discuss blister rust at fairs. Have had cases in New York where it was impossible to reach men except at a fair. These exhibits are a phase of education, not measured by concrete results. Erie Railroad Forestry train was a great success.

Mr. Sheals: Was of same opinion as McNerney for a few seasons. During filibuster in Rhode Island, they did not have any fair exhibits, due to lack of funds. Had many people tell him that they missed the blister rust exhibit at the fairs.

Dr. York: To stop giving blister rust control publicity is the same as taking engine from train.

Mr. King: Believes results of local educational work should govern agent's policy.

BLISTER RUST AND THE YOUNGER GENERATION

By S. V. Holden
Vermont Blister Rust Control Agent

I believe the key to this subject is education. In fact I feel that education is the big problem that all blister rust workers are striving to put across during the short period that is now half gone. If we have not educated the younger generation as to blister rust and its behavior and the simplicity of its control, while we are carrying on this program, I believe we have fallen far short of the goal we set out to reach.

Just how to reach this goal and get all our white pine protected from this treacherous disease in a limited time, has been a problem for all of us.

We may agree on some special method of reaching the present-day pine owner, either through his children, his neighbor, or his banker, if not through direct contact; but just how to educate the younger generation in blister rust control so that they may and will carry on the work that we have started is a matter of no small importance.

In Vermont I believe we have met with some success along this line, with moving pictures, talks in rural and high schools, field trips to demonstration areas with 4-H clubs and biology classes; and of course bulletins, roadside demonstrations, and posters serve this purpose. I believe we should find a way to place a blister rust bulletin in the hands of every child of school age and continue this practice until the program is over.

The school children of today are pine owners of tomorrow, and the pine owners of tomorrow must be educated by the blister rust workers of today, if they are to carry on the work efficiently.

Discussion

Mr. Richardson: Do you think Miscellaneous Circular 40 is suitable for school children?

Mr. Holden: This subject coming up for discussion later. My chief criticism is that it is too large.

Mr. Conner: Has any work been done with Boy Scouts? I have been called upon to do some work along this line in my district.

Mr. Bradder: I was master of troop of scouts. Several of their fathers happened to be pine owners and cooperated in blister rust control. Doing some work with 10 troops in his present district. In one instance the boys did eradication work on tract of land given them. Scouts form nucleus for future blister rust workers.

Mr. Corliss: 2000 scouts in New Hampshire. Part of agents' work is to take them out at times and follow program, which has been worked up with scout officials. Has taken out no less than 500 scouts himself.

Mr. Herr: I was a boy scout. I believe there is a wonderful opportunity for work along this line and have already taken steps to cooperate with scouts in my district.

Mr. Kane: Tells of hike with boys - looking for infection Ribes, etc. Boys very much interested and have invited him to many of their troop meetings.

Mr. Bradder: Interviewed president of local lumber company regarding blister rust control, and found him not interested. On second visit, man was very cordial and Bradder had no difficulty in signing him up. Found that his son was a member of his scout troop. Good example of what work with boys will do.

Mr. Corliss: Tells of trip up mountain with boys. Held contests in tree identification and locating blister rust infection and Ribes.

Mr. Newman: Asks Nichols to tell of blister rust poster contest, conducted in his district in New York State. Hope to carry out same idea in New Hampshire this winter.

(Mr. Nichols out of room.)

Mr. King: (chairman) Brings up subject of new motion picture, for discussion.

Mr. Pierce: Plan to have new film. Only one scenario has been turned in to date. Wants to find out from men the type of picture desired, especially points which should be featured.

Miscellaneous Circular #40 is being revised.

New poster - "This Lot Has Been Protected From Blister Rust" has been sent to Government Printing Office, but not returned. Due before first of year.

Slides and enlarged photographs are available at Washington for field men.

Mr. King: Asks if it is possible to show life history of blister rust in film.

Mr. Pierce: Maybe - will find out.

P A P E R S

on

C O N T R O L A C T I V I T I E S

PROGRESS OF COOPERATIVE BLISTER RUST CONTROL WORK IN THE EASTERN STATES

By E. C. Filler
Bureau of Plant Industry,
U.S. Department of Agriculture.

Blister rust control has been making steady progress since the present program was initiated in June, 1922. Since that time a total of 4,031,996 acres in New England and New York have been cleared of 38,548,653* wild and 254,835 cultivated Ribes, at a per acre cost of 18 cents. In the application of control measures 16,460 individual cooperators have spent $197,454.45. In addition, $187,635.17 has been expended from 588 town appropriations in four States. Several thousand additional persons have cooperated by destroying their cultivated bushes without compensation, or by aiding the control program in other ways.

Since the beginning of control work in 1917, a total of 54,225,858 wild and cultivated Ribes have been eradicated, in New England and New York, from 5,331,461 acres; a section larger than the entire land area of Massachusetts.

Results of Control Work in The Northeastern States During 1926.

In New England and New York, a total of 814,856 acres were cleared of 8,765,015* wild and 50,384 cultivated Ribes, at an average cost of 17.9 cents per acre. In comparing the 1926 work with 1925, substantial increases in acreage examined for Ribes, are noted in Connecticut, Maine, Rhode Island, and New York. However, decreases in the other States, especially New Hampshire, caused the total acreage for all States to be reduced 2.3% below that of last year.

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* The New York Ribes figures for 1926 are estimates.

However, 20.1% more Ribes were pulled during 1926, with a corresponding increase of 2 bushes per acre, and an additional average cost of 1.3 cents per acre.

Town Cooperation

A total of 128 towns in Maine, New Hampshire, Vermont, and Connecticut expended $41,421.28 in eradicating Ribes. Vermont and Connecticut each had one cooperating town. In New Hampshire 203,539 acres were worked in cooperation with 81 towns. This acreage, while 19.1% less than last year, represents 24.9% of the total area covered in the Northeastern States during 1926. In Vermont and Maine the town funds were used to cooperate with individuals in Ribes eradication, while in New Hampshire the town is the cooperating unit. The town appropriation of $250 in Connecticut was used with State funds for Ribes eradication work. Compared with last year, the number of cooperating towns decreased 3%, but this was offset by an increase of 2.1% in the amount of town money expended.

Individual Cooperation

In New England and New York 4,023 individuals expended $44,554, in cooperation with the States, in clearing 242,806 acres of Ribes. Increases occurred in Connecticut, New York, and Massachusetts in the number of individual cooperators, amount expended by individuals, and the acreage worked. Decreases in number of cooperators and acreage examined are noted in the other States, except in Rhode Island, where the control work is conducted by the State. The decreases in number of cooperators in New Hampshire and Maine, however, are offset by increases in amount of money expended by individuals in these States.

The acreage worked in cooperation with individuals represents 29.8%

of the total area examined in the Northeastern States during 1926. Of the total number of individual cooperators, 741 assisted only in the removal of cultivated Ribes. Comparing the totals of the individual cooperative work in all States during 1926 with the preceding year, the number of cooperators is shown to be practically the same, but the amount of money expended by individuals increased 12.2%, and the acreage examined was increased 15.7%.

State Scouting

Three States - Maine, Massachusetts, and Rhode Island - scouted lands containing few Ribes. In Maine 86.5% of the total acreage covered was worked on this basis, and in Massachusetts and Rhode Island 28.8% and 100.0% respectively. In Connecticut 3,932 acres were worked by State crews and scouts, at State expense, except for a $250 town appropriation. The total cost of this work was $16,582.59 for destroying the Ribes on 349,942 acres. This acreage represents 43.1% of the total area worked in the Northeast during 1926. This year 4.6% less acreage was worked on this basis than during 1925; however, Maine and Rhode Island showed gains of 12.4% and 10.0%, respectively, in the amount of this type of work.

State Land Projects

Ribes eradication work on State lands was performed in Massachusetts, New York, Vermont, and New Hampshire. A total of 17,694 acres were covered at a cost of $14,325.20. Most of this work was performed in Massachusetts and New York. The acreage eradicated of Ribes on State lands represents 2.2% of the total area worked in the Northeastern States during 1926. This year 187.0% more acreage was worked on State lands than in 1925, and 48.5% more money was expended on this project.

Re-eradication

Re-eradication was conducted in all the New England States during 1926; 48,009 acres being reworked, or 5.9% of the total area examined for Ribes this season in the Northeastern States. Two-thirds of this re-eradication work was performed in New Hampshire.

The Ribes eradication work is the direct result of successful educational and service activities. In order to appreciate more fully the status of these phases of our program, the following summaries of the permanent agents' work are given for the period January 1 to September 30.

Educational Features

Items	Totals for period Jan. 1 - Sept. 30, 1926	Percentage of increase or decrease for period Jan.-Sept., 1926 over 1925	Monthly number per average agent, Jan. - Sept., 1926
Meetings addressed	374	- 23.0%	1.21
Attendance	25,204	- 23.3	-
Field Demonstration meetings	120	- 11.8	.39
Attendance	3,082	+ 74.3	-
Fair and Window demonstration	385	- 20.8	1.24
Publications	64,924	+ 16.1	210.9
News items	875	- 13.1	2.84
Posters	4,793	- 8.4	15.6

During the first 9 months of 1926, a general decrease occurred in all educational items except publications distributed and attendance at field demonstration meetings. However, Connecticut, Rhode Island, and Massachusetts made substantial gains in most of these features, while in the other States there was a consistent slump which lowered the average figures.

Service Activities			Daily number per average agent, 1926.
Initial interviews	7,648	- 16.0	0.97
Follow-up calls	5,418	- 1.1	.65
Individual(control methods)	2,779	- 3.9	.35
Instruction (disease)	4,593	+ 5.5	.58

A decrease for the period January 1 to September 30 is apparent in all service features except number of individuals instructed in the disease. The changes are insignificant, however, except in number of initial interviews, which decreased 1,462 when compared with a corresponding period in 1925. Compared with 1924, there is a decrease of 2,233 initial interviews. All States except New York, Rhode Island, and Connecticut had sharp decreases in number of initial interviews. As cooperation is largely the result of personal interviews, no reduction should occur in this phase of the service work.

Time spent on each project by average permanent agent, January 1 - September 30, 1926

Project	Percentage of time spent on each project by average permanent agent	
	1926	1925
Education	16.2	17.6
Personal service	14.7	14.3
Supervision	14.9	14.9
Scouting	6.9	8.7
Eradication	0.4	0.4
Mapping	1.1	1.0
Office	24.1	20.0
Travel	21.7	23.1

The only marked change is an increase of 4.1% in the amount of time spent in the office. This now makes about one-fourth of the agents' time used on this project. However, a large part of the office work is spent on items which could be classified as educational or service activities.

Summary of Blister Rust Control Work, During 1926, in the Lake States, Pennsylvania, and New Jersey.

In New Jersey a limited amount of scouting by the State Department of Agriculture showed the rust to be present on black currants at Red Bank, Shrewsbury, and Greenwood Lake.

Scouting in Pennsylvania was conducted, in cooperation with the State Department of Agriculture, in four of the northern counties. Rust infection was found on Ribes nigrum (2 bushes in each case) in the counties of Monroe, Pike, and Lackawanna. In Susquehanna county, infection was discovered at Brooklyn on wild gooseberries growing near a young pine plantation. Infection was not found on the pines, but it is most likely present. In general the results of the survey work in Pennsylvania indicate an annual spread of aeciospores over the northeastern section of the State, resulting in isolated cases of black currant infection, followed by the occasional occurrence of local pine infection.

Work in Michigan was limited to inspection of Ribes in nurseries and commercial plantings, by State inspectors in connection with their regular duties. No rust was located, but several nurseries were found to possess black currants. In such cases steps were taken to have the bushes destroyed.

In Wisconsin data were taken on continuing investigations under way in the Eau Galle experimental area. These experiments deal with control

practices and Ribes studies. The field work has been completed on several of the experiments and the results are being summarized as rapidly as possible. Rust was found this year in the Eau Galle area on Ribes missouriensis and R. cynosbati in four locations. This is the first appearance of the disease on the area. Pine and Ribes infections were also found near the Elk Mound and Deer Park infection areas. A local center of infection near Range, discovered in 1925, was eradicated of Ribes in September, 1926, and the infected pine destroyed. On the Menominee Indian Reservation at Keshena, two crews of Indians, under the supervision of Mr. L. O. Grapp, eradicated 250 acres in and around an old infection center; 150 acres being re-eradication work.

In Minnesota, eleven permanent pine infection study plots were established; seven in the Rush Lake area, one at Lawrence Creek in Chisago County, one at Henriette, one at Duluth, and one in the Stanchfield area. Also seven Ribes regrowth plots were established; five at Rush Lake, one at Lawrence Creek, and one at Henriette. The data from these plots are not sufficient to draw conclusions, but it is quite obvious that Ribes are returning fairly rapidly in the Rush Lake area.

The period from August 22 to September 15 was spent in scouting in sections where the disease had previously been reported, and in locating new infections. Only two new pine infection areas were found, and they were in proximity to older areas; one at Dalbo and the other one mile west of Henriette. Infection on Ribes cynosbati and R. hirtellum was located about nine miles south of Wahkon. The amount of blister rust on the Ribes indicated there was an infection on pine in the vicinity, but in the time available it was impossible to find it. Pine and Ribes infections were

again found near Two Harbors and Duluth, and Ribes infection was located several miles north of Duluth,

at the same place as reported last year. Apparently, the rust has not yet spread, or, if so, is only sparsely scattered, along the north shore of Lake Superior.

The infection which was reported last year on Ribes hudsonianum was relocated and confirmed this year. Although this infection was slight, it is probable that there is pine infection in close proximity. The location of this infection is just north of Duluth.

The results of our 1926 activities are now a matter of record. In spite of earnest effort, decreases have occurred in some phases of our work. This should not discourage us; rather it should spur us on with renewed energy to increase the volume of our work, and at the same time make it more effective. Here are a few suggestions, especially applicable to the Northeastern States:

1. Push the cartographical survey to completion to ascertain exactly where our work stands, and effectively plan for future initial control work and re-eradication of Ribes. (The cooperation of each man is essential to complete this project.)

2. Develop a more adequate system of checking to insure effective control work. (In some cases we are apparently too easily satisfied and are taking too much for granted.)

3. Greater use of scouting methods in sections where Ribes are more or less localized.

4. So conduct our educational and service activities that the owner appreciates we are doing him a real service, rather than that he is doing the State a favor to cooperate. (In some instances there has been too much pussy-footing in an effort to secure cooperation.)

5. Establish a definite yearly goal with plans for attainment. (No business firm could retain the services of salesmen who do not at least offset their cost by sales or its equivalent.)

6. Most important of all, however, is to develop those personal qualities essential to successful leadership. What are these qualities? They are many, but according to the Director of Extension of Ohio, who reported an extensive study of the personal qualities possessed by the county agents in 38 States, the following qualities are found to a high degree in the successful agents: Integrity, perserverance, faith, ability to plan, vision, initiative, and courage. Technical knowledge rated far below these qualities. It does not signify that subject matter is unimportant, but it does mean that, no matter how proficient one may be in technical knowledge, he stands little chance of success as an agent unless he possesses the seven qualities mentioned above. This Director also found the poorest agents failed chiefly in four qualities: Enthusiasm, vision, ability to plan, and initiative. My personal observations have convinced me of the truth of this statement.

All of these personal qualities can be developed. Integrity is the bed rock on which success is built. Perserverance, that quality which knows no defeat, is essential to clinch cooperation. Our enthusiasm depends largely on faith in ourselves and our job. To be effective, it must be a self-generated type. Effective planning is based on adequate and thorough analysis of our problems. Vision signifies ability to see into the future and plan accordingly, while initiative is the assertive force which acoomplishes improvements. Without this quality, a man soon goes stale on the job. All these qualities are of little value, however, unless we have courage of our own convictions, and courage to meet squarely our tasks. We have a real job in blister rust control, which demands our best. Let's give it.

Discussion

Mr. Cullen: Do you consider anyone who voluntarily gives up his bushes a cooperator?

Mr. Filler: No, not unless he personally pulls up the bushes or employs someone to do this work. The mere act of allowing the bushes to be pulled without compensation, does not rate one as a cooperator under our classification.

GETTING OUT RIBES BY SCOUTING AND TWO AND THREE MAN ERADICATION METHODS

By S. D. Connor
Maine Blister Rust Control Agent

When considering the one factor of getting out Ribes, from the standpoint of initial eradication, the ideal method seems to be by a trained crew. However, when this method becomes impossible because of lack of financial support there are but three alternatives: Get more money, have each owner do his own eradication, or don't do it at all. This work needs to be done and must be done if we are to continue as a major white pine producing community. More financial support from our State is not forthcoming, and therefore the only way left is for each owner to do his own eradication job with any help he can get from the Federal and State Governments together with such assistance as his town offers. Our small Maine towns can not afford crew work without more State assistance than they now get.

This, then, is the problem, and the first requisite in solving it is to make every pine owner want to do his own eradication. Any man who is physically able can pull Ribes if he knows what they look like and wants to work. Our job is to make him want to pull them and then teach him how to do it.

These two factors are kept in mind from the very first. All men employed are given a thorough understanding of the disease and are shown local areas demonstrating that blister rust is doing a lot of damage and that this damage can be prevented by Ribes eradication. They are also taught that blister rust control is an essential part of the great conservation movement. The entire success of the owner method of eradication is in making the owner want to do his work and do it well. In order to have this successful, every blister rust worker who comes in contact with the owner must be thoroughly

sold to his job. The personnel consists of temporary agents and town foremen. This year when the temporary agents of Cumberland County reported for duty they were given three days of intensive training in theory and in office and field work. When these agents left this three-day school every man knew blister rust and he knew that he knew it. He had confidence in himself and he knew that he was directly responsible for making a successful interview out of every contact. He also knew that he was responsible for locating Ribes areas and keeping these areas accurately charted on his maps.

Few Ribes are destroyed by the agents while scouting; their job while scounting being mainly to locate Ribes areas. The reason for this is that we aim to teach the owner to do his own eradication in the future, and if we destroy his Ribes we are taking the very material away from him which he should have to work with. After the Ribes areas are located by the agent, the owner is interviewed, told of existing conditions, and, if he desires, is shown the conditions on his lot. As a result of this interview the owner agrees to do his eradication. Out of 443 initial interviews in Cumberland County this year not one refused to cooperate.

A list of cooperators, accompanied by maps, is given to the town foreman, who in every case is a local man. He is paid from town funds and assists each cooperating owner with his eradication job. This foreman is trained in scouting as well as in eradication methods, and by being shown conditions in his own county he is convinced of the seriousness of the blister rust situation and the feasibility of control. From the list of cooperating owners given him by the agent, the foreman arranges his schedule of work. The agent plans to keep eight or ten names ahead of each foreman, and in this way there is always a waiting list.

The crew consists of the forman, the owner, and usually the owner's son or hired man. It may happen that the owner does not have a hired man or a son, and he will ask the foreman if he knows of anyone he can get to help on the job. There are usually several men in each town who have had some experience and are glad to get the work. This makes the work of the foreman easier, because he then has but one inexperienced man to deal with in the crew. The foreman works in the line, and the paper-trail method of marking strips is used. The foreman is responsible for making at least one crew check on each lot worked. This shows both owner and foreman the quality of their work. This work is also checked by the temporary agent who did the scouting, and about 75% of the jobs are again checked by the county blister rust agent. In addition to this, the work may also be checked by the State Leader, and this year some of the work was given Federal inspection by Mr. Hodgkins. In case poor work is found, the owner is again interviewed and arrangements made to do the eradication again.

The average job is about two days, and in this time the owner not only learns the approved methods of eradication and the identification of wild Ribes, but he also learns the location of the Ribes areas on his lot. This is of the utmost importance, because in the future he knows what parts of his lot need the most attention. That owners take a real interest in the work is shown by the large number of them who follow up their eradication by continually checking around whenever they are on their lots. In many cases they go over their lots systematically with their own small crew the spring following the initial eradication. Not only is the owner taught to identify and destroy Ribes and the location of Ribes areas on his property, but the fact that he gets interested in blister rust control has a tendency to stimulate his interest in general forestry, and better woodlot practice often

results. Many examples of this can be cited.

In the case of lots owned by out-of-town owners who are unable to do their own eradication, a problem arises regarding the re-eradication work. In a case of this kind the owner pays for a small crew, under the supervision of the town foreman. Such a crew is usually composed of men with previous eradication experience, and the work they do is no different from work done by any other trained crew and the same high standard can be demanded. While it is true that there will be no one to do the follow-up eradication on these lots, it appears that they should not need it any more than any other area eradicated by a trained crew.

The results obtained by two and three man eradication crews seem to show that such crews can do efficient eradication even though composed of inexperienced men, provided a competent foreman is in charge of the crew, and provided the crew members are interested in doing good work.

The following points seem worthy of consideration regarding this method of eradication.

1. In order to be successful, every man coming in contact with the owners must have a thorough training in blister rust and preferably some knowledge of general forestry, and above all he must believe in his work.

2. The pine owners can be interested in blister rust control to the extent that they are anxious to do their own eradication.

3. The interested owner soon becomes an efficient crew member.

4. The work of two and three man crews is efficient and economical.

5. Because of the training the foremen receive, there is always a man in each town who is available to give expert advice to the owners regarding their blister rust problems.

6. The educational value to the owner, who learns by doing, is greater than by other methods.

7. The owner learns where the Ribes areas on his property are located.

8. The owners better appreciate the job of blister rust control, and we hear less unfavorable comment regarding the work. This is especially true if the owner did his work on a hot, sticky day when the mosquitoes were thick.

9. The owner will be trained to assist in any re-eradication work.

10. An interest in general forestry is stimulated, which directly results in better woodlot practice and an increased interest in forest legislation.

Discussion

Mr. Littlefield: Was two and three man eradication used on all types of ground, and was it successful?

Mr. Conner: Yes. Strips were narrower where Ribes were abundant.

Mr. Littlefield: Would you advise this procedure for general practice?

Mr. Conner: No. It is done in Maine because of lack of funds. Efficiency is probably 5% less than regular crew work. Refers to Hodgkins, who made checks on Maine work during 1926.

Mr. Hodgkins: No definite figures on check work with him, but believes it compares favorably with trained crew work.

Mr. Riley: Asks if lower efficiency is not probably due to fact that foreman is working in line with crew.

Mr. Conner: Yes.

Mr. Cullen: Asks for details regarding 443 successful interviews.

Mr. Conner: All agreed to eradicate, but ten have not done work to date.

Mr. Cullen: Asks if educational work done by this method will stimulate owners to do their work in the future.

Mr. Conner: Has found that owners (majority) are continually checking their lands for bushes. Agents advise re-eradication early in spring.

Mr. Richardson: Asks for further particulars regarding the 443 successful interviews.

Mr. Conner: Explains that work is done systematically, and each owner is visited. Also explains that Maine law requires owners to do work.

Mr. King: Asks if they have any difficulty in getting owners to put in sufficient amount of time on eradication.

Mr. Conner: Most owners have only small acreage. Owners of large tracts usually hire small crew.

Mr. Hodgkins: Asks if town appropriation is any incentive for owners to eradicate.

Mr. Conner: Yes - they get man to assist them, free of charge.

Mr. Newman: Do any of owners pool their labor? Have one town in New Hampshire which is unlikely to appropriate. Apparently, only solution is to get land owners, with State forman, to clean up their lands.

Mr. Conner: Not often.

Mr. Clark: Asks cost per day of labor.

Mr. Conner: $3, $3.50, and $4.

Mr. Riley: Asks if they clean up all land in town, whether within 900 feet of pine or not.

Mr. Conner: Scout all land which has pine worth protecting. Non-pine lands are eliminated.

Mr. Roop: His experience along this line very similar to Conner's Uses small crew. Take town, block by block. All territory worked. Efficiency is not so high as crew method. Educational returns more than offset difference in efficiency.

Mr. Endersbee: Backs up views of Conner and Roop. Tells of five-man crew used on one big job in his district. Compared with two and three man eradication, the precentage of efficiency was practically the same. Out of over 200 interviews in his district last season, only two individuals refused to cooperate.

Mr. Richardson: Asks if foreman does checking behind crew.

Mr. Endersbee: Not much checking done by foreman. State scouts and agent do most of this work.

Mr. Rose: Would a two-man crew, if experienced, do as good work as a five-man crew?

Mr. Endersbee: Believes they would.

Mr. Cullen: Asks regarding the difference in securing individual cooperation (Endersbee's opinion) in New Hampshire compared with Maine and Massachusetts.

Mr. Endersbee: Is not satisfied that it can not be done in New Hampshire.

Mr. King: Never has secured 100% cooperation in his district. Has hands full with town cooperation. When more individual work was done, 30% successful cooperation as good as he could do.

Mr. Endersbee: Feels that men in New Hampshire have not been put to test as far as individual cooperation is concerned. Believes it can be secured in New Hampshire as well as any other State. Feeling is that State and towns will take care of it.

Mr. Holden: Secures greater part of individual cooperation in initial interviews.

Mr. Endersbee: Has schedule book and lists date for doing work. This has worked out satisfactorily in more than 90% of cases.

Dr. York: Asks what time of year he makes interviews.

Mr. Endersbee: Starts in spring.

EFFECTIVE SUPERVISION OF ERADICATION WORK

By Thomas J. King
New Hampshire Blister Rust Control Agent.

During the years in which I have been engaged in blister rust control there has been constantly impressed upon my mind the urgent need of planning and organization in whatever was to be undertaken. Without these two facors even the simplest undertaking presents almost insurmountable difficulties.

With them present it seems that the most difficult proposition is made simple. And in the case of blister rust control, with its many ramifications, there is a REAL need of the presence of these two factors if the agents' work is to be done effectively and satisfactorily all round. And there is no phase of our blister rust program where the need of planning and organization is greater than that of the eradication work.

This is the sphere into which I would like to carry you during the few minutes allotted me this afternoon, i.e., the planning, organizing, and effective supervision of eradication work from the agents' point of view. If in the narrating of my own practices and those of my associates, ideas occur to you which, properly modified to meet local conditions, seem to offer a solution of some of your own problems, then I shall feel that the time required to prepare this paper has not been wholly lost. After all, irrespective of the State policy under which we work, or the difference in local conditions, whether an agent is stationed in New England, New York, or the Lake States, there are certain definite and basic rules that must be followed in the eradication of Ribes.

The bulk of the educational program should, it seems to me, be so planned and executed that when the eradication season rolls around there will be a sufficient amount of cooperative work, individual or town, to keep an agent busy as long as it is possible to carry on control work practically and efficiently.

When the agent is about to enter upon the eradication season he should go off into his thinking corner and there map out his program of work for this period. First of all he should visualize the work that is before him. Next, zone his district and group his cooperative projects within these zones in such a manner as to enable him to handle them with

the smallest amount of travel. This will permit him to put more time into the supervision of each project. Then, in the case of the town cooperative project he should consult with the Selectmen, the town's official heads, for the purpose of choosing control areas, arranging for use of local help, if available, and selecting the town inspector--a fellow-townsman who represents the town during the prosecution of the control work in the town. At the same tentative arrangements can be made in securing field headquarters for the crew. A definite knowledge at the beginning of the season of the number of crews and men needed to complete his control program will enable an agent to make arrangements for securing them previous to the time he will need them. From among the number reporting he should choose those who impress him as being a type favorable for crew foremen and preliminary scouts. An agent should concentrate on his foremen, for they are the men who represent him when he is not in the field. One who is conscientious, practical, and a thinker makes an ideal type of foreman.

Having chosen his prospective foremen, the agent should, at the beginning of the season, develop these men for the responsible positions in which he contemplates using them. To do this properly, a foremen's training crew should be formed. This simply consists of placing in a single crew all men of foremen caliber, the agent to act as foreman. During this training period he can outline in detail, to the prospective foremen the various crew methods needed to meet individual situations, the proper handling of men, develop in them the proper attitude toward their work, outline what is expected of them, their powers and limitations, the importance of their position in the blister rust organization, the importance of properly representing the department for which they are working, the rights of the public, and the proper planning of their work. In short, so equip the foremen before

placing them in charge of a crew that once they do assume their foreman duties they will have the personal confidence and the ability to do work of a high caliber.

The foreman's work should at first be very frequently supervised by the agent. This is not only necessary but highly beneficial. Thorough explanations of methods of meeting problems as they are put up to the agent by the foreman should be given at the beginning so that it will not be necessary to go over the same problem twice. This will mean that, as the season progresses, the necessity of personally aiding in the solutions of the minor field problems of the foremen will have been eliminated. The ultimate object in view should be the development of each foreman to such a degree of efficiency that once a project is outlined to him he will be competent to carry it through to a successful conclusion should circumstances so develop that it might be impossible for the agent to visit him. Practically the same procedure should govern the training of an advance scout.

The proper handling of crews as units is of great importance in order that town appropriations be not exceeded. This necessitates keeping a close check on expenditures, especially as a project is drawing to a close. To do this, daily reports of expenditures should come from the field to the agent who keeps track of them through means of a simple book-keeping system. It also means that advance work, such as definitely outlining all details of the next project, be done a sufficient length of time ahead so that the crew can be moved with the smallest amount of lost time.

While the crew is working on a project, it is necessary that the agent give the field work close supervision in order that he may guide its progress and prevent confusion or inefficient work. This supervision gives

the agent a detailed knowledge of conditions, from which he can determine whether or not the work is progressing properly, and if not, will enable him to make the necessary corrections.

Hand in hand with the general supervision of his field work, a definite plan of checking of both crew and scout work on the part of the agent is most essential in order to determine the thoroughness of both these phases of control work.

The checking of the crew is best done by spending a portion of the time behind the crew and a portion checking areas already covered by it. The writer is of the opinion that the greatest benefit derived from checking behind the crew is the impression his presence in the field makes upon the crew members and foremen. They are, naturally, inclined to be more intent upon the details of their duties when the agent is present than at any other time. However, the very fact that they know he is liable to pop up unannounced tends to keep them more alert and on the job. Hence the practice of frequent visits is highly valuable. While with the crew the agent also has ample opportunity to determine the weak points of the crew organization, make suggestions to the foreman, and determine what changes, if any, are necessary in the organization. He can, at the same time, be sizing up the personnel of the crew to determine prospects for advancement to the position of foreman or scout. The agent can, at the same time, go over with the foreman, details of work to be done

From the crew the agent goes to the areas previously covered and checks there. Where the advance scout is used, crew work is confined principally to comparatively small areas here and there in a plot, the scout having eliminated the remaining territory.. The writer has adopted the policy of

first giving the crew areas a general checking by "stripping" through them to determine the general thoroughness of the work and then of taking certain spots in these same areas and going over them very carefully to determine the completeness of root eradication. If there are any stone walls in the areas worked by the crew, they also are checked. Our system calls for the working of roadsides by the crew because of the inability of a single man, the scout, to do them thoroughly, and because of the criticism that missed bushes along them would bring from the general public. The roadsides are naturally given a thorough checking.

The checking of the scout presents another problem. The scout examines all plots previous to the coming of the crew. He eliminates from crew work as much territory as he safely can, confining the organized work of the crew to those areas where the bushes are in abundance. A man to qualify for the position of scout must be of the conscientious, thorough-going type who is familiar with Ribes and their natural habitat, also familiar with the woods and able to size up a situation so as to determine when and where to call upon the services of the crew. He is usually required to spend some time as a crew member, where he develops the blister rust sense before being advanced to the scout's important and responsible position. He is then given intensive training with an experienced scout and thoroughly tested out before being put on his own.

The checking of the scout's work forms an important part of the agent's supervising program and, in the opinion of the writer, is of greater importance than that of the crew. Checking should be carried out along the same plan as that used by the scout in lining up an area, the brooks, runs, and swamps being given the first checking because of their being the most likely Ribes locations. Then attention should be given the higher lands.

These sections are best checked by the running of parallel strip lines through them. If the area eliminated by the scout should contain pastures, they are given especial attention, because our experience has shown that in this type scouts are more liable to miss bushes. Consequently our scouts are instructed to throw pastures containing scattered bushes into crew work. Finally, stone walls in the area eliminated by the scout are given a thorough checking. We also use the crew for the purpose of checking areas generally. By applying these practices in each plot worked, a definite knowledge of the caliber of eradication work can be obtained, and it is the most satisfactory system the writer has yet used.

The greatest aid to the writer in both checking and guiding the progress of his control work has been the scout map. The plot is taken as the working unit. This, in the case of the U.S. Geological Survey sheet, is enlarged six times to permit the plotting of interior details such as brooks, runs, stone walls, fences, etc. It also permits the plotting of forest types. The mapping of these details forces the scout to do his work more carefully and thoroughly without delaying him materially or making his duties more burdensome. It has, in fact, according to the testimony of the scouts working under the direction of the writer, served to intensify their interest in their work.

When the scout has finished with a plot he has a picture of the plot. On this sketch he has located Ribes areas and their limits for the crew to work. The foreman is enabled to take up his work from the details of the sketch without calling upon the scout to indicate them to him in the field. Where crew work is scattered the foreman can, by ascertaining from the scout the amount of work in each section, plan his next day's work.

The main map is left at headquarters, and the foreman sketches separately each evening what he needs for the next day's work. He also locates on the headquarters map each day's location of the crew. This enables the agent easily to locate the crew when he comes around. With this detailed map available, the agent can sit down at night with foreman and scout and plan work to be done. For checking purposes it is of great value.

With the crew work plainly indicated, it is very easy to place responsibility, should poor work be found. Checking with this sketch is more intelligently done because the agent has a picture of his plot to study before entering it. Sketches of this kind are invaluable in case it is found impossible to complete the work laid out. Simple notations on this sketch will show where the threads may be picked up another season. And when one considers the question of re-eradication, its value can not be overestimated. While these sketches are not worked out with tape and compass, measurements are paced off and a surprising degree of accuracy obtained.

In conclusion, the writer trusts that his hearers will not gather the impression from this paper that his activity during the field season is confined solely to eradication work. Not at all. It is very important as an educational measure to have people acquaint themselves first hand with the methods used in the eradication of Ribes, the various species of wild Ribes, the quality of eradication work which a well-trained crew can perform, to bring to their attention new areas of pine infection found by the crew or scout, to place exhibits in local post offices, stores, and at fairs, and place posters along roadsides. And this is also done.

Discussion

Mr. Corliss: Asks if agent tries to make foreman and scouts feel that they are part of the organization.

Mr. King: Certainly - makes them feel their responsibility and tries to build up these men. Foremen also have in mind the development of possible foreman material.

Mr. Corliss: Are there any other methods of checking scout work?

Mr. King: Take crew and run strips through block, covering all types of ground. With scout's sketches, it is very easy to make check on their work.

Mr. Swain: Explains his method of enlarging U.S.G.S. sheets of township for field men, by using cross-section paper, counting squares, and locating points on map. Tells of meeting held in his district for field personnel. Had men prepare papers regarding their various field problems.

Mr. Riley: Asks if photographic enlargements of maps are available in Washington.

Mr. Pierce: To some extent. Shows enlargement of U.S.G.S. sheet, which was made for agent Tarbox, of Maine.

P A P E R S

on

O F F I C E A C T I V I T I E S

THE OFFICE AND THE FIELD MAN

By W. P. Cox
Bureau of Plant Industry, U.S. Department of Agriculture.

I was surprised last Friday when informed by Mr. Allanson that he desired me to attend the Blister Rust Conference and get personally acquainted with you gentlemen. I did not understand that I was to make a formal talk, but only to discuss the various provisions of the fiscal regulations, especially the reasons for making the numerous suspensions from your accounts.

I consider it a great pleasure to be here with you, and to discuss the many fiscal matters that have been so perplexing for the past few years. I feel somewhat out of place before you today in attempting to make an address especially when I have listened to the eloquent talks given by those who have preceded me. This reminds me of a story that I heard several years ago. Someone met an old negro, and asked him if he could change a twenty dollar bill. He replied, "Boss, I am sorry that I can not accommodate you, but I thank you for the compliment just the same." This expresses my feelings today with regard to my talk; and, as I stated, although I am not an orator, I thank you for the compliment just the same.

Before going into details concerning the many items to be discussed here today, I think it would be fitting to give you a few statistics to show the extent of the activities of the United States Department of Agriculture. During the fiscal year ending June 30, 1927, Congress has appropriated for expenses of the Department $139,635,823. During the fiscal year ended June 30, 1926, Mr. Zappone, Disbursing Clerk of the Department, issued 397,292 checks, and paid 242,591 vouchers. On November 30, 1926, there were employed in the Department 20,659 persons, of whom approximately 5,000 were in the City of Washington. On November 30, 1926, there were 1,901

employees in the Bureau of Plant Industry. The total appropriation for this Bureau for the present fiscal year is $3,908,055, of which $368,280 is for the eradication or control of the white pine blister rust. The Bureau of Plant Industry certified for payment during the past fiscal year 25,000 vouchers and issued 15,000 transportation requests and 1,627 letters of authorization.

The first item that I will discuss is subsistence between the hours of 8 a.m. and 6 p.m. On March 7, 1924, the Comptroller General issued a decision on this question, and I wish to quote from the syllabus, as follows:

> "Short temporary absences from headquarters on official business trips at such hours and under such conditions as to negative the incurring of any actual expenses for subsistence do not entitle the employee to a per diem, or any fractional part of a per diem, in lieu of subsistence."

The various departments of the Government paid very little attention to this decision, and the accounts were passed for payment without deduction. On September 30, 1924, the Comptroller General issued another decision on this question, as follows:

> "An employee who is absent from his official station on official business for a period of ten hours or less between the hours of 8 a.m. and 6 p.m. is not in a travel status within the meaning of the laws authorizing reimbursement of subsistence expenses either on an actual basis or a per diem in lieu of subsistence basis, and is consequently not entitled to reimbursement for any subsistence expenses incurred therein."

This was the first decision in which the hours of departure and arrival were definitely stated, namely, ten hours between 8 a.m. and 6 p.m. This decision was issued on September 30, 1924, but did not reach the Bureau until November 13, 1924. I also wish to quote from the closing paragraph, as follows:

"In view of the practice which obtained with the apparent sanction of the accounting officers prior to the publication of the decisions of March and April, 1924, heretofore cited, disallowances will not be made in the settlement of disbursing officers' accounts covering periods prior to July 1, 1924, on account of payments made in accordance with such practices if otherwise correct and proper."

This answers the question why the decision was made retroactive and it was necessary to call upon you gentlemen for refunds of considerable amounts of money. Before calling for these refunds every effort was made to have the Comptroller change his decision so as to make it effective subsequent to September 30, 1924, but without avail. To make a test case and to have the matter definitely settled, Mr. Herbert S. Ward, employed in the Office of the Secretary, left Washington, D. C., at 11:15 a.m. on October 6, 1924, and proceeded to Alexandria, Virginia, a distance of seven miles, and returned to his official station at 2 p.m. the same day, and incurred an expense of $1.50 for dinner. This item was suspended by the Department, based on the Comptroller General's ruling. Mr. Ward submitted the item of $1.50 to the United States Court of Claims, for final determination, and the same was allowed. The decision of the Court of Claims was referred to the Comptroller General with the hope that he would either revoke or modify his previous decisions. This he declined to do, and I wish to quote you, in part, from his reply to the Secretary of Agriculture August 11, 1925, as follows:

"A Government employee who is required to and does make short daily trips of a few hours' duration between the hours of 8 a.m. and 6 p.m. from his post of duty ordinarily does not have his domestic relations disturbed thereby, and such trips do not constitute traveling on duty away from his designated post of duty. The memorandum opinion of the Court of Claims in the Ward case, which appears contrary to its prior opinion in the Hartman and Test cases, can not be accepted by this office as establishing a contrary rule for the disbursement of general appropriations."

When travel was by common carriers no objection was made, as the traveller was compelled to leave and arrive at his headquarters according to the schedule. From the number of accounts received where travel was via personally-owned automobile or Government-owned machines, it appeared that the time of travel was regulated to claim subsistence. As soon as the accounts reached the Comptroller General's office they were promptly suspended for explanation. On September 23, 1925, the Comptroller issued another decision, as follows:

> "An employee of the Reclamation Service, under authority of a travel order specifically directing daily trips from his headquarters to certain outside points and return, who departed from his headquarters before 8 a.m. and returned thereto after 6 p.m., each day, it being shown that the departure before 8 a.m. and the return after 6 p.m. were necessary in the performance of his official duties, was for such periods of absence in a travel status entitling him to reimbursement for actual expenses incurred for meals, as provided in his travel orders."

He further states in this decision as follows:

> "It may be stated in this connection that any practice of employees departing from headquarters shortly before 8 a.m. and returning thereto shortly after 6 p.m. on the same day for the purpose of establishing a travel status entitling to reimbursement for subsistence expenses is a matter for correction by the administrative officers concerned; and in any case when it is apparent that the departure before 8 a.m. or the return after 6 p.m. was not necessary in the performance of official duty no right to actual expenses of subsistence, or per diem in lieu thereof, can arise therefrom."

I also wish to call attention to a letter from the Comptroller General to the Secretary of Agriculture under date of November 5, 1926, as follows:

> "My attention has been directed to numerous vouchers in the accounts of A. Zappone, Disbursing Clerk, Department of Agriculture, and other disbursing officers of the Department, covering payments made for subsistence to officers and employees absent on official business from

their stations on automobile trips when they leave their stations prior to 8 a.m. or return after 6 p.m. It has been held that when an officer or employee of the Government departs from his headquarters by means of an automobile on short trips before 8 a.m. and returns thereto after 6 p.m., it not being shown that the departure before 8 a.m. or return after 6 p.m. were necessary in the performance of official duty, he was not for such period of absence from his headquarters in a travel status entitling him to reimbursement for actual expenses of subsistence or a per diem in lieu thereof. It is requested that whenever charges for subsistence are made on vouchers by officers or employees absent from their headquarters on short trips, there be submitted with the vouchers evidence tending to show that the leaving before 8 a.m., or returning after 6 p.m., were necessary in the interest of the Government, if such be the case. Please advise this office of the action taken by you in this matter, in order that suspensions and disallowances in various accounts may be avoided."

Your attention is also invited to the following circular issued November 5, 1926, by Dr. W. W. Stockberger, Director of Personnel and Business Administration of the Department of Agriculture:

"Attached will be found copy of letter of the Comptroller General to the Secretary of October 22, 1926, requesting that officers who claim subsistence for official trips by automobile of less than 24 hours' duration where official station is left before 8 a.m. or arrived at after 6 p.m. add to the voucher a statement of the circumstances necessitating the early departure or late return. The communication indicates that in the absence of such a showing the subsistence charges will not hereafter be allowed. Employees of the Department should accordingly take notice that in default of compliance with this requirement, subsistence charges under the circumstances recited can not be approved for payment. In preparing the explanatory statement stereotyped general expressions as to necessity should be avoided. Reference should be made to the distance covered, the time required for transaction of official business at one or more points visited, with some supporting indication of the volume of the work, and to the particular occasion for reaching a given destination at a specified hour or to other features obviously influencing the duration of the trip."

I have gone into considerable detail on this question, with a view to explaining the many decisions that have been rendered and the efforts

of the Department to have them either revoked or modified. It is therefore requested that you cooperate with us and furnish the explanation requested by Dr. W. W. Stockberger, Director of Personnel and Business Administration. I shall be glad to answer any questions you may wish to ask on the subject.

Under the new Standardized Government Travel Regulations effective October 1, 1926, provision is made for the payment of garage rent and bridge, ferry, and other tolls, when travel is on an actual expense basis. These items are not allowable when travel is on a mileage basis. This question has been referred to the Bureau of the Budget for amendment so as to allow the same. Up to this time no action has been taken, and it is necessary to suspend these items, in order to have them resubmitted and sent to the Comptroller for direct settlement. We have had numerous suspensions when the traveler did not return to his official station each night, especially when his work was only a few miles distant. One case that was brought to our attention showed that subsistence was claimed at a point only one-half mile from his official station. By making suitable explanation regarding such items we can usually have them passed by the accounting office.

I should like to ask you gentlemen if you are receiving promptly your salary checks and also checks covering your reimbursement accounts. During the summer months the accounts are received by the thousands. I was informed by one of the members of this conference that some time ago he did not receive his check within a reasonable time and thought that the delay was due to my office. It was ascertained that the account was held up for about two weeks because the State Leader was absent from his official station.

When I was introduced to the members of this conference, one of the first remarks made to me was that they had not met me before but had received

numerous letters from me. I suppose nearly all of you have received the unwelcome letters, and if any one present has not received one and will kindly give me his name and address I will send him one on my return to Washington. I occasionally receive letters of commendation from the field employees regarding information furnished and the prompt payment of accounts. These letters are welcomed at all times. I receive quite a number of letters from employees in reply to my letters suspending items from their accounts, that are filled with sarcastic remarks, and, as I term it, dynamite. A recent letter reads as follows:

> "I have your letter with the accompanying evidence that the charge of $2 now disallowed by the General Accounting Office was paid to me. As my explanation failed to justify the expenditure and as I have had recently little practice in extemporaneous mendacity I am remitting herewith, by postal order, the amount of the suspended charge."

Such letters are read and placed in our files for future reference. One of the members said to me that he was agreeably surprised when he met me, as he had pictured me to be an entirely different person. I replied that he had no doubt thought he would meet an old grouch with long whiskers. An employee visiting Washington a few years ago was surprised to find that I did not have horns, and I am sorry that my letters appear to have given you also that impression. I have been accused of stealing money suspended from accounts. Some years ago I wrote several letters to an employee asking for a remittance of 50 cents, and finally received the money, with a statement that so long as she was deprived of the money she hoped that I would make good use of it. Several years ago, down in Virginia, an old negro was informed that the gentleman for whom he worked had suspected him of stealing hams. He answered: "I have been working for this gentleman for twenty years,

and he has not missed anything that I stole yet." I have been in the Bureau for twenty years, and no one has missed anything that I have stolen yet.

After all, we are human, and members of one large family working to one common purpose, although we may view our work from different angles.

As I have attempted to explain (and as I think you now appreciate), I am but a cog in the great Government machine, and am bound absolutely by the laws in the auditing of your accounts, my sole purpose being the performance of my duties in the most efficient and satisfactory manner to all concerned. I am exceedingly glad to have had the opportunity to attend this conference and to dispel some of the erroneous impressions that have existed, and it is my sincere hope that a better understanding and feeling will result therefrom.

Discussion

Dr. Spaulding: Is simple, signed statement, to the effect that it was necessary to leave official station before, and return after hours of 8 a.m. and 6 p.m. respectively, sufficient?

Mr. Cox: Explanatory statement showing just "why" should be furnished in accordance with circular letter of Dr. W. W. Stockberger, Nov. 5, 1926, cited.

Mr. Richardson: Will one statement for the entire month serve the purpose?

Mr. Cox: Yes, if same reason is applicable in each case.

Mr. Newman: How does this ruling affect single meals?

Mr. Cox: Allowed for period of time lapsing over 8 a.m. and 6 p.m., if accompanied by satisfactory statement in accordance with Dr. Stockberger's circular letter cited above.

Mr. Amadon: States case of man coming to Albany night before, when it would have been possible for him to get a 5 a.m. train the next morning. Item for hotel lodging deducted.

Mr. Cox: Some statement as to necessity of this would be sufficient.

Mr. Detwiler: To illustrate regulations, tells of buying snowshoes for field men. Before accounts was approved, it was shown that they did not fit any individual man.

Mr. Frost: Had considerable trouble with accounts of temporary agents during past season. Their headquarters were made in the same town as that of the permanent agent with whom they were working. In one case, temporary agent lived in next town to headquarters. Items for expenses were suspended.

Mr. Cox: Comptroller General has ruled that an employee's headquarters should be at place where his work is performed.

Mr. Amadon: One New York agent with district subdivided by Hudson River had ferry charges disallowed. What is reason?

Mr. Cox: Similar case in Washington now being discussed. Suggests that New York man continue to submit this item, and after ruling is straightened out, accounts can be settled.

Mr. Filler: In case of telephone calls, what is the reason for putting in "Official Business," when everything in the account is supposed to be official?

Mr. Cox: True, but required. (Paragraph 84, Travel Regulations.)

Mr. Filler: In travel status, what explanation is needed outside of "official call"?

Mr. Cox: Date, points, amount, name of party called, time.

Mr. Cox: Vouchers are required for all items $1 or over.

Mr. Frost: Is expense allowed for towing?

Mr. Cox: No.

Mr. Roop: Authorization allows him to travel within 100 miles of headquarters (by auto) in Massachusetts. Obliged to go to point in New Hampshire accessible only by car. Expense item suspended.

Mr. Cox: Should have requested authority beforehand.

Mr. Cox: It is not permissible to hire auto from any member of employee's family.

Mr. Pierce: When authorization is for $5 and amount of expense is $5.10, is it advisable to submit only amount allowed?

Mr. Cox: No, submit actual expense, and Dept. will make deductions.

Dr. York: Suggests rising vote of thanks to Mr. Cox for being present and telling us of Government wheels of machinery.

(Unanimously carried)

OFFICE PROCEDURE (MAPS AND RECORDS)

By G. S. Doore
Massachusetts Blister Rust Control Agent

I believe it is true that we all agree that in the work in which we are engaged adequate records are essential. Now by adequate records we mean records that will tell the story of what has been done in any particular area, tell it simply, with reasonable accuracy and clearness. Granted, then, that the records must be adequate, our real problem must be to obtain these records with the least expenditure of time in order not to utilize time that should be devoted to other important phases of our work.

With this aim in view -- that is, to obtain safe and sane records of our field work--the agents in Massachusetts set out last winter to pool their ideas and to develop a system.

As a basis of the system as finally adopted we have the town map, which in Massachusetts is simply a two-time outline enlargement of the United States topographical map, dolled up a bit to make each map a presentable township map. (Sample map explained.) Each unit of land definitely surrounded by roads or water system is designated as a block and has assigned to it a definite number. This block number system is the basis of all our records.

On these maps the agent shows <u>as best he can</u> the general location of all areas of white pine worth protecting. The boundaries of these pine areas are shown by means of a dotted line. In showing these areas we use four simple symbols:

P.R. - Pine reproduction
P.P. Pine plantation.
P.M. Pine under 8" D.B.H.
P.O. Pine over 8" D.B.H.

This is an adeuqte representation for purposes of blister rust control.

As his interview work progresses, the agent plots in -- again to the best of his ability-the lines showing property ownership, and assigns to each such lot a number which is identical with the number on the interview record card.

During the course of the year the agent locates pine infection of course. Such infections are shown on his map by the red triangle, but instead of the solid triangle we use a hollow triangle and insert the number to indicate the relative abundance of infection. For instance, if we find from 1 to 25 infected trees, we place in the hollow triangle the number corresponding to the number of trees. If more than 25 trees are located we use a symbol M, meaning many.

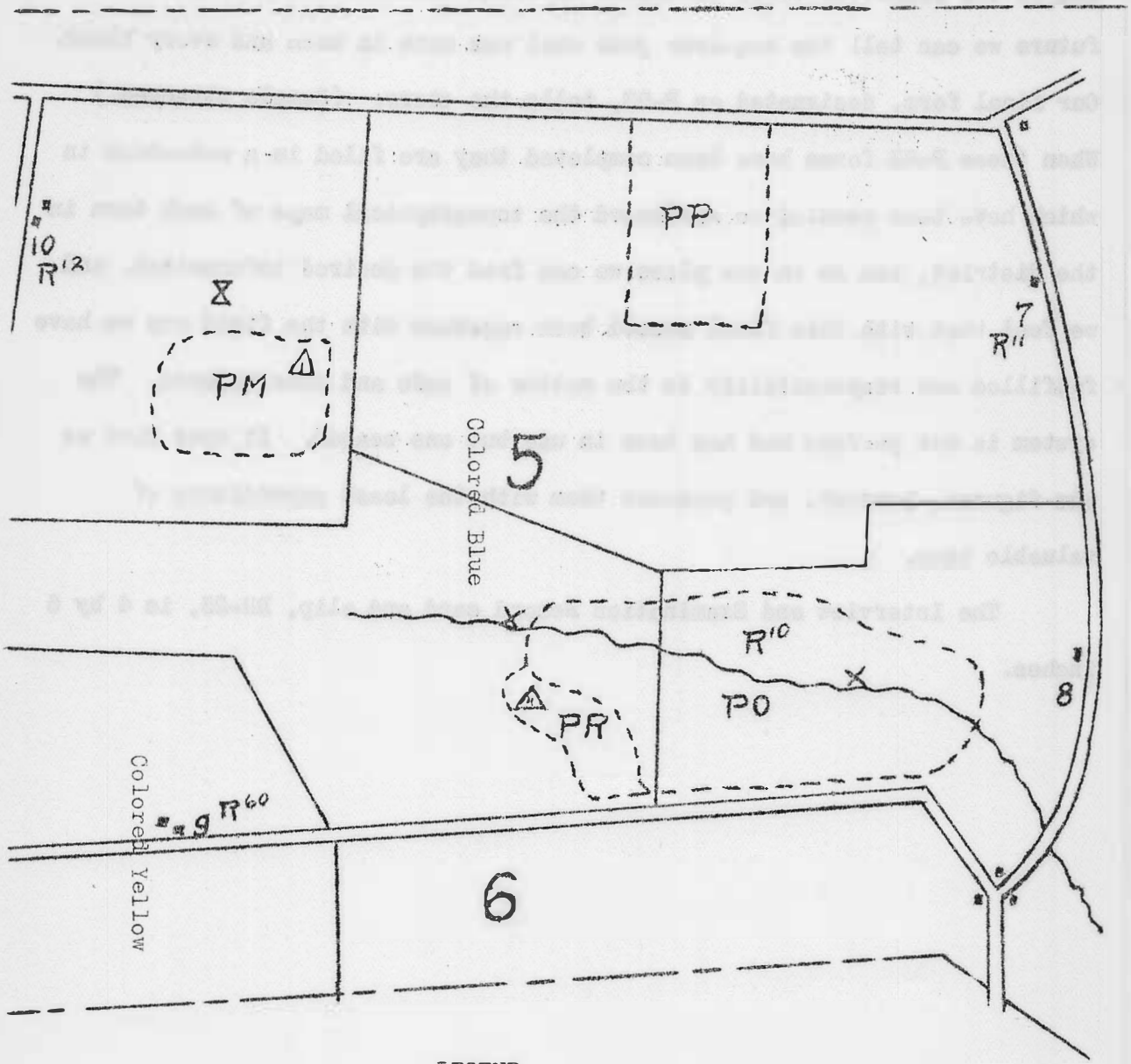
Now comes the Ribes eradication season. The owner goes over his land in company with the State foreman, and the Ribes are removed. The area which is examined is then indicated on the map by the use of a color scheme, a definite color being used for each year. All land which is eliminated because of the absence of white pine is shown on the map in one color, yellow.

In the old days we used an array of crosses to indicate the location of Ribes, with the result that in many cases our field maps were one mass of little crosses. In order to have as few symbols on the map as possible we now use but one or two crosses on a particular lot to denote the location of the most abundant Ribes. In cases where the bushes are generally distributed over the entire lot we so designate with the use of the cross with a line at the top and bottom. Now to designate the abundance of Ribes on any particular lot we use the symbol R with exponent, as R^{12} for instance, meaning that there were 12 Ribes per acre on that particular lot. That completes the records as far as our field map is concerned.

From the interview record card and from the daily B.R.-1 reports we are able under the Massachusetts system to figure out at the end of each season the essential data, tabulated by block numbers, and at any time in the future we can tell the enquirer just what was done in each and every block. Our final form, designated as P-93, tells the story. (Sample attached.) When these P-93 forms have been completed they are filed in a note-book in which have been mounted on cardboard the topographical maps of each town in the district, and so in one place we can find the desired information, and we feel that with this final record book together with the field map we have fulfilled our responsibility in the matter of safe and sane records. The system is not perfect and has been in use but one season. It does give us the figures, however, and produces them with the least expenditure of valuable time.

The Interview and Examination Record card and slip, BR-25, is 4 by 6 inches.

SAMPLE FIELD MAP
Massachusetts



LEGEND

——	LOT LINES	Yellow	AREA ELIMINATED
----	PINE TYPE LINES	X	RIBES GENERALLY DISTRIBUTE D
PR	PINE REPRODUCTION	X No.	ABUNDANT RIBES
PP	PINE PLANTATION	R	RIBES PER ACRE
PM	PINE UNDER 8" DBH		PINE INFECTION
7	INTERVIEW RECORD No.		1 to 25 TREES
	AREA EXAMINED BY YEARS		MORE THAN 25 TREES
	1926 1927 1928	P.O.	PINE UNDER 8" DBH

Front

INTERVIEW AND EXAMINATION RECORD

B.R.-25

No. . . . . Name . . . . . Address. . . . . .
Block No. . . . . Town . . . . . County . . . . . Date . . .
Occupation . . . . . Total acreage owned (all land). . . . .
Total acreage needing eradication . . . . . Estimated cost . . . . .
No. acres in pine (Plantation) Under 8" (. . . . Over 8" (. . . . Total (. . . .
(Natural) (. . . . (. . . . (. . . .
Relative abundance wild Ribes: (None-Spot-General). Infection found: (None-Spot-General).
Attitude of owner. . . . . .
Remarks. . . . . .
. . . . . .

CHECK RECORD

Agent's Checks (Plat or Strip) Other Than Behind Crew

Date Made	Kind of Check	Acres in Check	Ribes Orig.	Ribes on Check				% Eff. Orig.	Time Spent	By
				G.	Sk.	R.-B.	LBS			
. . . .	. . . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. .
. . . .	. . . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. .
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. . . .	. . . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. .

Reverse

ERADICATION RECORD

B.R.-25.

No. acres eradicated ..... No. men employed ..... No. additional acres to eradicate .....
R. eradication methods used .....

Dates	Blk. No.	Wild Ribes Destroyed				Cult. Ribes	Owner's Expenditures				State Expenditures			
		Goose	Sk.C.	R.-B.	Total		Hours	Wages	Exp.	Total	Hours	Wages	Exp.	Total
Total														

Eradication approved by ..... Date .....
Remarks .....

_____
Town

No. of cooperators removing wild Ribes_____Amount expended_____

No. of cooperators removing cultivated Ribes_____Amount expended_____

Total number of cooperating land owners_____Total expended_____

Estimated area of pine protected _____% under 8" D. B. H._____

Total land area examined for Ribes _____

Total number wild Ribes removed _____No. cult. Ribes_____

Abundance and distribution of Pine in the town:

Abundance and distribution of wild Ribes in the town:

Statement regarding the removal of cultivated Ribes:

Financial Summary:

	State Department	Cooperator	Total
Wages			
Expenses			
Totals:	_____	_____	_____

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BLISTER RUST CONTROL -- RIBES ERADICATION RECORD, 192

_____
Town

BLOCK NO.	BLOCK AREA	ACREAGE OF PINE		AREA EXAM.	NUMBER OF RIBES ERADICATED								RIBES PER A. ON CHK	L.B.S. PER A. ON CHK
		UNDER 8"	OVER 8"		W.G.	SKUNKS	W.R.&B.	CULT BLK.	CULT FLWG.	CULT R.&W.	CULT G.	TOTAL RIBES		

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Discussion

Mr. Newman: Asks if subdivisions are made by natural boundaries.

Mr. Doore: Yes.

Mr. King: Asks if they experience any difficulty in locating owners' boundary lines.

Mr. Doore: Not usually.

P A P E R S

on

E X P E R I M E N T A L A C T I V I T I E S

PRACTICAL LESSONS FROM BLISTER RUST HISTORY

By L. H. Pennington

New York State College of Forestry, Syracuse University.

Introduction

In its broadest aspects the history of the white pine blister rust in America may be considered under three subdivisions, as follows:

First is its history from the human standpoint. This includes (a) the introduction of the rust upon its host plants into America; (b) the attempt, first, to eradicate it entirely, and next, to control it locally; (c) the direct results upon forestry practice primarily with respect to white pine; and (d) the indirect results in the education of the public upon matters of plant quarantine, disease prevention, etc.

Second is the life history of the fungus Cronartium ribicola in all its details.

Third is what may be termed the natural history. This takes into consideration the behavior of the rust with respect to all agencies which have any effect upon it.

History

The history of the rust in America has been worked out fairly well, particularly with reference to its introduction into the country and the attempts to control it. The results both direct and indirect are only beginning to be realized. They will, however, become evident just to the extent that the destructiveness of the rust becomes known. One outstanding fact is that man was directly responsible for the introduction of the rust into all the regions in which it is found, the Eastern States, the Lake States, and the Pacific Northwest. The first practical lesson from this is to prevent the further spread by man of this rust as well as other diseases, by the enforcement of a rigid

quarantine against the indiscriminate transportation of host or parasite from one part of the country into another.

Life History

The life history of Cronartium ribicola has been worked out very thoroughly. The practical lesson is that the rust upon pine may be controlled absolutely by the elimination of the Ribes. Various practical details as to how this is to be done depend upon various facts in the natural history of the three plants concerned, - white pine, Ribes, and the fungus.

Natural History

The natural history of the rust considered as a disease might be called more appropriately epidemiology. It is concerned not merely with the natural history of the fungus, Cronartium ribicola, but with the natural histories of white pine and all species of Ribes.

It is probable that ultimately blister control will be based upon a knowledge of the natural history of the rust. Although comparatively little is known about this history, some things are becoming fairly obvious, and from them some practical lessons may be learned.

In the first place, when the rust has once become established in a locality it is very persistent and not easily eradicated. Observations made in many localities from which the rust was thought to have been eradicated have shown that it is still present. A tabulation of infection centers in New York, New England, and the Lake States, prepared in the Office of Blister Rust Control, shows that the rust is still present in at least 75% of the places from which it was supposed to have been eradicated. It is doubtful if the rust has been entirely eliminated from many of the localities in which it was not found when the last observations were made.

In the second place, it has become very evident that the rust has spread

from relatively small centers where it was originally introduced. Apparently wind-borne aeciospores have been the means by which new centers of infection have been established long distances from the original centers. These centers of infection have been found in many places in New England, Northeastern New York, the Catskill Mountains, Ontario, Wisconsin, and Minnesota. The age of the oldest cankers in some of these places shows that infection must have occurred before the rust had become abundant enough to cause the production of large quantities of aeciospores.

These two facts - namely, that the rust tends to persist where it has once become established, and that by natural spread new centers of infection are established at relatively long distances from infected pines-force us to the conclusion that the rust is already established in places where its presence is not suspected, and that all parts of the country with white pine and Ribes eventually will have blister rust control problems to meet. The obvious practical lesson is to discover the rust and to practice control before the damage becomes serious.

Although some of the facts in blister rust natural history are fairly well known and some conclusions and lessons can be drawn from them, others are not well known. Anomalous conditions are frequently found which need explanation, for without explanation erroneous conclusions may be drawn. Some of these conditions are as follows:

Occasionally pine infection has been found far from any known Ribes. After making allowances for the possible presence of Ribes at an earlier date, it is still quite apparent that under certain conditions spores have carried infection from Ribes to pine over longer distances than it was believed possible.

Occasionally pines with very little or no infection are found near thrifty Ribes nigrum bushes. On the other hand, heavy infection may be found upon pines

near the relatively resistant R. vulgare or R. americanum.

It is apparently true that the rust works faster in some pines than in others. Sometimes a pine seems to be immune for a period and then to become susceptible to infection.

It is also true that wrong conclusions have been based upon faulty data. Records made from memory are frequently wrong, particularly when dates are involved. Sometimes errors are made through mistakes in the identification of Ribes.

From these and many similar instances which might be cited we are forced to the conclusion that existing records should be checked carefully and that much more data both from experiments and from field observations should be obtained.

Much valuable data may be collected by everyone who has anything to do with the blister rust. Each man might well keep a note book and record systematically year after year his observations upon the rust and its hosts as he finds them in his particular locality. Usual phenomena should be noted. Particular attention, however, should be given to phenomena which seem to be unusual; for example, cases of apparent immunity in either pine or Ribes, exceptional susceptibility of Ribes species commonly resistant to the rust, apparent long-distance spread from Ribes to pine, unusually rapid or unusually slow growth of the rust, etc. These are but a few of the things which may be noted. If a new center of infection is found, the time of the oldest infection should be determined together with the species of Ribes responsible, wherever possible.

A few general suggestions may not be amiss.

First, dates and localities should be kept. The localities in which observations are made should be recorded by description or sketch map, so that they may be relocated readily.

Second, observations in which the identity of plants, particularly of Ribes,

is involved should be fortified by specimens. Branches and leaves are easily pressed and dried so they will keep indefinitely.

Third, small amounts of quantitative data procured by actual count or measurement are more valuable than general statements.

In conclusion, a very important lesson from the history of white pine blister rust is this: Its natural history, or epidemiology, must be understood before complete and perfect system of control can be formulated.

Discussion

Dr. York: Brings up point of various men in blister rust organization getting data. Suggests committee be appointed to draw up form stipulating how this material may be collected, shipped, and what is needed. Men may render invaluable service in this way.

Mr. Detwiler: Suggests that Drs. Spaulding, Pennington, and York, and Mr. Posey act as advisers to committee appointed by chairman.

Mr. Chairman: Appoints Messrs. Perry, Frost, and Amadon as committee.

THE WHITE PINE BLISTER RUST IN EUROPE

By Perley Spaulding,
Northeastern Forest Experiment Station

In order to get a proper perspective of this disease and its status in Europe we must consider the relative importance and esteem of the general public for forests. The forested area of Europe is rather limited. Lumber is relatively high in value, and the per capita consumption of lumber and wood is, to an American, unbelievably low. Europe has about one-fourth as many species of timber trees as North America north of Mexico. Foreign species which promise to be valuable are prized, and considerable experimentation in growing them has been and is still being done there. Arboretums are abundant and contain numerous species from all over the world. A considerable number of the five-leaved pines are grown in arboretums and as ornamentals, but mostly in but small numbers. Pinus strobus has been grown very generally and widely in nearly all parts of Europe except the Mediterranean region. Its distribution there may be likened to that of Pinus sylvestris in the Northeastern States. No other white pine approaches it in abundance; hence it is the pine host for the blister rust in Europe, as there is no native white pine which is known to be very susceptible and the native species are not very widely distributed.

Ribes nigrum, R. vulgare and R. grossularia are generally cultivated throughout the area where the climate favors Pinus strobus. They are great favorites and nearly every garden has them. Except for certain areas in the mountains, there are almost no wild Ribes.

In practically all of Europe which was visited, the blister rust is found almost exclusively on Pinus strobus and Ribes nigrum. Eliminating these two hosts would control the disease and largely eliminate it. The climate of Europe appears to be even more favorable to the disease than is our own. With the two worst

hosts in greatest abundance and with climatic conditions favoring it generally, it is no wonder that it has run wild and spread all over Europe with a viciousness which it has shown here only in certain regions. The attitude of the forester there is one of fatalistic hopelessness, and no genuine attempt is known to have been made to fight it efficiently. Because of the favorable conditions, it has spread farther from Ribes nigrum to pines than it has here. This means that wider safety zones must be used there if any attempt is ever made to fight it with any degree of success. In this respect we are fortunate in being able to use minimum width zones rather than maximum ones.

While Ribes nigrum never was such a strong factor in distributing the disease here as it is in Europe, it is a wise move to eliminate it here, especially in the West where the disease has not yet penetrated. If wild Ribes were as scarce with us as they are in Europe this would almost completely stop the disease.

Discussion

Mr. Filley: Is there any other European pine which would carry the rust?

Dr. Spaulding: No.

Mr. Posey: Did you find wild Ribes nigrum?

Dr. Spaulding: Did not, but it is reported growing in mountains in some parts of Europe. Native to Europe.

Mr. Riley: Do you think eradication of nigrum would be as important a factor in controlling the disease in this country?

Dr. Spaulding: No.

Mr. Detwiler: Asks maximum distance of spread from nigrum to pine in Europe.

Dr. Spaulding: Saw place well upward toward a mile.

Mr. Pierce: Asks if Dr. Spaulding has come out with a statement regarding spread of mile.

Dr. Spaulding: Has not.

PESTS OR PATIENCE

By H. H. York

New York Conservation Commission

Chestnut blight and white pine blister rust were first recognized in America, respectively in 1904 and 1906. The advent of these diseases may be said to mark the beginning of a new phase of forest practice in our country, namely, forest tree pest control.

In the later nineties, there was an increasing interest in the propagation of fancy chestnuts on a large commercial scale in some of the Eastern States. Some of the more desirable varieties of chestnut trees were natives of Japan. American nurserymen, not being able to supply the immediate demands for such trees from their own nurseries, found it much easier to obtain them in Japan. An unrestricted importation of hundreds of thousands of chestnut trees from that country resulted in the introduction of chestnut blight into America. The path of the destruction of this disease is now so complete that apparently the only hope of the North American chestnut surviving and regaining its place as a forest tree lies in the possible existence of immune trees or trees attacked by the blight becoming so highly resistant as to be able to completely recover. These trees can be used in the propagation of resistant strains by seed and hybridization with species of chestnut from other parts of the world which are known to be highly resistant.

The application of the principles of plant breeding and selection in the development of a disease-resistant forest trees is an entirely new phase of forestry in America. Experiments of this sort are now under way to procure blight-resistant chestnut trees. But the time, patience, and skill involved in these undertakings will be vastly greater than what would have been required in the scientific propagation of chestnut nursery stock here in America.

The circumstances attendant on the introduction of white pine blister rust into America are strikingly similar to those of the entrance of chestnut blight. Nurserymen here in this country were unable to supply the demands for white pine planting stock. It was easier and cheaper to buy these trees in France and Germany than to take the time and patience required to produce them here in America. The unrestricted importation of millions of seedling white pine thus led to another destructive forest tree disease becoming established in our country.

Soon after the discovery of the chestnut blight it was recognized by some forest pathologists that this disease was beyond human control, even though a great experiment involving the expenditure of hundreds of thousands of dollars was undertaken to check the spread of this disease. The hopelessness of saving the American chestnut undoubtedly influenced the attitude of mind taken toward white pine blister rust in the years immediately following its discovery.

The practicability of eradicating currants and gooseberry bushes on a large scale as a protective measure against white pine blister rust was doubted by many persons with forestry interests. The natural tendency on the part of many persons was (and is yet) to plant other species of tree immune to blister rust and other pests in place of white pine. Pinus sylvestris (Scotch pine) was one of the species chosen in place of white pine, because it was immune to blister rust and was believed to be resistant to other pests here in America. Scotch pine was recognized as a rapid grower. It was comparatively easy to obtain seed and nursery stock from Europe. In the 20 years following the discovery of blister rust in America, millions of Scotch pine have been planted in the Northeast, especially in New York. When the writer made his first contact with the Northeastern States in 1916 on blister rust control work, Scotch pine was being highly praised because of its adaptability to poor soils, its very

rapid growth, and its freedom from disease and insects.

But now we find the growth of this species as a rule is extremely crooked and its freedom from fungous and insect pests is being greatly questioned Let us note some of the fungous and insect enemies of the Scotch pine in New York, and since they occur in this State, we may expect to find them more or less throughout the entire Northeast.

In June of 1925 a rust which is a gall-forming Peridermium was discovered on Scotch pine bordering Round Lake near Woodgate, N. Y. These plantations were established by the broadcasting of seed which were imported from Germany and established in 1870-74-79-80-83. The disease attacks trees of all ages. At Woodgate they exhibit a varying degree of susceptibility. Some trees are attacked with great virulence. One tree about 15 years old and 15 feet high had over 18,600 galls. Many trees apparently are immune to the disease. However, we find trees which have been highly exposed to infection may not become infected for a period of 5-10 years. Trees only slightly susceptible may remain so for a period of years and then become highly susceptible. Trees 2-4 years may often be killed within a very few years, or the tree may live for several years, becoming greatly dwarfed, often bushy, and becomes unfit for timber.

This rust is autoecious at Woodgate, i.e., spreads from tree to tree. The source of this rust is unknown. There seem to be three possible sources: (1) It may be a rust which has been confused with Cronartium cerebrum, a native of the Eastern United States. (2) It may be a form of the so-called Cronartium harknessii of the West. (3) This rust may be of foreign origin. At present this seems most likely, and if such is the case it is probably Asiatic, as no gall-forming rusts of this sort are known to occur in Europe.

Just how serious the Woodgate rust may prove to be can not be determined at this time. If we knew absolutely that it would confine itself to Scotch pine, probably there would not be the cause to worry that there is. However, we are not sure that it may not become a very serious menace to our Scotch pine. The disease has been at Woodgate at least 30 years. Only in about the past five years has it really begun to move. It made a tremendous spread at Woodgate in 1924. There is a national aspect to this situation. We do not know what the Woodgate rust will do to other hard pines of the Northeast and of the South Atlantic States. New York does not want to be harboring a disease which may menace other parts of the country. Woodgate seems to be the oldest center of infection. We are trying to find the extent of the distribution of this rust in New York. There are two main lines of infection, one from near Trenton Falls through the Black River Valley beyond Croghan, the other extending northeast from Woodgate to Dannemora, a distance of 110 miles or more.

The Conservation Commission is cooperating with the Office of Forest Pathology in a very intensive study of the Woodgate rust. The essential facts of the biology of this rust, its distribution, source, and identity, should be known before announcing any definite policy with reference to its control. Judging from all we know at present, the Woodgate rust seems to be a bad actor.

In the introduction of Scotch pine into America, as well as with other foreign species of forest trees, apparently little thought has been given as to how our native fungous parasites and insects might react toward them. For example: We have known for sometime that Cronartium comptoniae will attack the Scotch pine. Last June, Blister Rust Control Agent Baker of Saratoga County brought to my attention what seems to be a serious infection of this rust on Scotch pine. The plantation has been established only three or four years, yet by actual count 10 per cent of the trees had cankers bearing the aecia of

Cronartium comptoniae. As yet we do not have data to speak authoritatively, but it certainly seems, judging from three plantations of Scotch pine in this State which the writer examined rather carefully in June, 1926, that Cronartium comptoniae may prove to be a real menace to plantations of young Scotch pine.

About the middle of June, 1926, Agent Baker called my attention to numerous dead and dying trees in a plantation of Scotch pine in Saratoga County. The trees are about 12-14 years old. At first examination they appeared to be infected with the "shoestring fungus" (Armillaria melleus). The base of an infested tree was encased with a thick hard crust of soil formed as the result of the exudation of water and gum from wounds in this part of the tree. On breaking away this crust and cutting into the tree, small white grubs about one-half inch in length were found. Similar grubs were also found in resin-lined cases in the crust. A few trees were cut down and the stumps with the surrounding crust were removed to the writer's office and wrapped with layers of cheese-cloth. In about a week, weevils closely resembling the white pine weevil began to emerge. They were identified by Dr. E. P. Felt, State Entomologist in New York as Pissodes approximatus. This gentleman, who is making a further study of the situation, has stated that he has also found the Pales weevil (Hylobius pales) occuring with the Pissodes approximatus. Apparently every tree in the plantation in Saratoga County is infested and the entire plantation seems doomed. This same trouble has been found in three other plantations of Scotch pine in New York, and whatever it may be, it certainly seems to have a very serious aspect.

Your attention was first called to the "Woodgate Peridermium" (this name will be used for the lack of a better one) that you may be on the lookout for this disease.

The disease and insect pests of Scotch pine which have been discussed may

be taken as examples of what may be expected in the introduction of exotic species of forest trees into this country. Our experience with Scotch pine indicates that rather than plant exotic species of forest trees on a large scale, no matter how promising they may appear to be, they should be planted experimentally until it is known, after a period of years, how they will respond to our climatic conditions and how our indigenous parasitic fungi and insects will react toward them. This is matter of time and patience rather than ease and speed.

The planting of Pinus resinosa, red or Norway pine, is being urged in place of other pines, especially on sites of better quality, because of its freedom from serious fungous and insect pests. The red pine is unquestionably a most desirable tree for forest planting. In the first place, how should red pine as well as any species be used in forest tree plantings? Who can tell? The fact that red pine is seemingly free from fungous and insect enemies at the present time does not mean that it will be so 30 to 50 years from now. As a matter of fact there are some insects and fungi which are known to attack the red pine. With our man-made forests and other changed conditions, due primarily to man's activities, it certainly seems that the red pine, as well as other seemingly immune species of forest trees, may in time be as seriously menaced by fungous and insect pests as is true of the American chestnut and white pine.

It should also be borne in mind that in nature we ordinarily find forest-tree species restricted to certain types of land and exposure to climatic conditions. In the rush to reforest, the natural tendency is to plant species of forest trees which are seemingly free from pests and to plant them more or less irrespective of site conditions. Such procedure will undoubtedly

lead to various kinds of failures and discouragements, also probably some successes; but it can be expected that a forest-tree species, as is often true with other plant species when placed under unnatural conditions, will become more susceptible to fungous and insect attack and climatic injury.

A forest-tree species is not necessarily to be discarded because it is subject to serious fungous and insect pests. Regardless of all that has been said concerning the Scotch pine, it undoubtedly seems to have a very definite and permanent place in forest planting, especially in New York. We have thousands of acres of blow sand, once under cultivation, which can best be reclaimed by planting with Scotch pine. So far as we know, no other forest tree in America is so adaptable to such conditions as the Scotch pine. This being the case, it certainly seems urgent that we know how, if possible, to combat successfully its insect and fungous enemies and at least practice necessary pest-control measures where Scotch pine will grow to a better advantage than any other tree.

There are numerous forest-tree fungi and insects in this country which are being given very little attention, if any, other than a taxonomic interest. These organisms are nevertheless producing enormous drains upon our forests which exceed annually those of fire. An increasing timber shortage which can be met only by the scientific management of our existing forests and the complete utilization of all available nonagricultural lands for forest plantings demands that rigid control measures be practiced against all injurious forest-tree pests.

Forest-tree pest control in the future will not be simply a matter of eliminating alternate host plants or creosoting egg clusters, as is now being done in blister rust and gipsy moth work, but there must be intensive measures of prevention, such as sanitation, thinning, a common sense selection of species

for each planting site, the rigid encouragement of quarantine measures, and a rigid supervision of the transportation of trees by all carriers, including automobile tourists.

For almost 200 years there has been an unrestricted and unlimited introduction of almost all sorts of plants from various parts of the world into America, and no section of our country has received so abundantly of these importations as the Northeast. We do not know what foreign forest-tree fungi and insect enemies are lurking here in this part of our country only to break forth like a mighty explosion when least expected. Reforestation and forest conservation are not progressing at a sufficient speed, but a haphazard rush will undoubtedly mean increasing armies of forest-tree pests, destruction, and discouragement. Forest-tree pest control as a definite part of forestry is here to stay and should be so recognized. The burdens of forest-tree pest control may be heavy, but carefully planned scientific studies, with an unlimited faith and patience, will greatly lessen their weight.

There is no group of foresters in America today who have the daily and a closer contact with the woodlands of the Northeast as the blister rust control agents. In a sense they are the "watch dogs" of the farm woodlots in this section of our country. While the agents' mission is to bring about the successful control of white pine blister rust, they should always be on the watch for unfamiliar forest-tree diseases and insect pests and when discovered bring them immediately to the attention of some specialist.

A growth study was made about ten years ago of the plantations at Woodgate by a very able forester, who says he never saw the galls of the "Woodgate Peridermium." In recent years a number of foresters, including a teacher of forest pathology, saw this rust and quietly passed it by. It matters not

whether a forest-tree disease or insect trouble may seem insignificant to you, find out if such is actually the case. It is always better to call the doctor than to wait until the patient begins to die.

Discussion

Dr. Metcalf: Supplements Dr. York's paper with a request for information on this disease. Looks as if it might attack western yellow pine and southern turpentine pine. It is no minor matter and should not be judged by value of Scotch pine.

Dr. Spaulding: Fact that Scotch pine is the principal pine in Europe is reason for so many diseases being present on this species.

Dr. York: Scotch pine is very crooked tree, but will second or third generation from natural seeding be so?

Mr. Pierce: How do we know it is autoecious? Are there any oaks or other alternate hosts of gall-forming Peridermiums present

Dr. York: In collecting specimens of gall rust on pine, make sure of the proximity of oaks. No oak trees within ten miles of Woodgate area.

Mr. Pierce: Have any trees been killed by the rust?

Dr. York: Yes.

FIELD INVESTIGATIONS IN BLISTER RUST CONTROL

By E. W. Littlefield

New York Conservation Commission.

The title of this paper, as shown on the program, is rather too broad to fit the very narrow scope of the work which it describes. This work deals with Ribes only, and only with one special phase of Ribes investigation. We have, however, always taken a particular interest here in New York in the subject of Ribes, not only in the light of past performance, but of future expectation as well. Our interest along this line may be said to be so deep that it goes beyond mere destruction, in some cases to protection, or even to propagation!

In the capacity, more or less, of the official Ribes hound of the New York "outfit," I have been privileged during the past three years to undertake a number of experiments laid out by Dr. York for the study of Ribes.

A considerable amount of pioneer work of this sort was carried on by the Washington office and other agencies in the period from 1917 to 1923, and is still being carried on. This has been valuable in forming to quite an extent the basis for our own work since 1923. Our only thought in establishing this separate line of investigations was to make further contributions to what we consider an all-important phase of the control work, and to get certain data which would be especially applicable to our own problems.

Three years, however, represent hardly more than a start in this type of work. Personally, I have about come to the conclusion that at least ten years are needed to get really substantial data along this line. Certainly it takes four or five years; and in looking over our results to date we find that there is very little material sufficiently developed to be worth reporting at this time. Much of it is still in an embryonic stage.

We were fortunate, however, in that one of our predecessors, Mr. Brooks, was of an investigative turn of mind; and we are just now beginning to reap the results of his labors. Of particular interest in this respect is an experiment laid out by Mr. Brooks in 1919 and completed under Dr. York in 1924, known as the "Deerhead Leaf Count." This, by the way, has nothing to do with game protection. The "Deerhead" part refers to a certain locality in the town of Lewis, N. Y., in which the area was situated. Mr. Nichols, of Lewis, was in charge of the field work in 1919, and being present this afternoon, can correct me if I make any false statements.

I have been urged to make this as "snappy" as possible; for that reason, I will present the results in the approved classroom form of outline, to avoid all possible waste motion or wasted time:

1. Object and Scope of the experiment.

   a. To get a count of the Ribes, together with their number of leaves, on an area of known size.

   b. To perform an "absolute" eradication of an area.
   (I may say that we view the term "absolute eradication" in much the same light as "absolute zero" - a theoretical constant which may be approached to a greater or lesser degree, but which does not exist for practical purposes. I do believe, however, that it was approached with some degree of closeness in this case).

This was in order to find out;

   (1) How many times this would require going over the area.

   (2) What per cent of the Ribes material would be removed in the first working.

   c. To establish an area free of Ribes, for later observation.

2. Procedure

   a. Original working, fall of 1919 and spring of 1920.

      A 10-acre area laid out in a typical pine-hardwood lot in Lewis, Essex County, N. Y.

      Eradicated successively 6 times, by a crew of 4-6 men and foreman.

Ribes and number of leaves recorded.

b. Later working, August, 1924

The same area re-eradicated successively 9 times by a crew of 3-8 men and foreman.

Ribes, number of leaves and live stem recorded.

3. Results

1919-20

Ribes (mostly gooseberries) per acre	219
Leaves " "	15000
Leaves per bush	69
Ribes removed first time over	87%
Leaves " " " "	98%

1924

Ribes per acre	53
Leaves " "	625
" per bush	12
Live stem per acre (feet)	27
" " " bush	0.5
Leaves per foot of live stem	23
Ribes removed first time over	60%
Leaves " " " "	70%
Live stem " " " "	72%

1924 compared with 1919

Ribes	24% as many
Leaves	4% " "
Leaves per bush	17% " "

When it comes to drawing conclusions from this experiment, I am, frankly, going to "pass the buck" to some of you gentlemen who know more about it than I do. I am going to present what seem to me to be the two leading questions which are raised by a consideration of these results-- not necessarily for discussion at this time, but as food for thought and perhaps for discussion in the future. This matter of re-eradication is a thing that will have to be worried about sooner or later; and if we do a little more worrying now, perhaps we shall not have to do so much later. The questions I have in mind are these:

(1) Can the Ribes replacement on this lot be considered typical of what may be taking place on other similar lots in the Northeast which have been eradicated five years or more?

(2) Do 53 Ribes per acre, averaging one-half foot of live stem per bush, and bearing a total of 625 leaves per acre, constitute a menace to the average white pine stand?

Discussion

Mr. Filley: In first working, in 1919, how many times did it take to get 95% efficiency?

Mr. Littlefield: Thinks first two or three workings accomplished this. In 1924 they were all small bushes and much more difficult to find. 53 Ribes per acre on check did not include any Ribes seedlings of current year.

EARLY DEFOLIATION OF RIBES AS INFLUENCING THEIR VISIBILITY

By A. E. Fivaz

Bureau of Plant Industry, U. S. Department of Agriculture

When a new man arrives on the eradication job, the foreman drills him on the recognition of Ribes primarily by leaf characteristics. The new man becomes efficient in locating Ribes when practice makes him so familiar with the shape and nature of the Ribes leaf that similar leaves seem to stand out of every mass of foliage he looks over. No one will question the statement that leaves are the major identifying factor generally used in the locating of Ribes for eradication.

Since the Ribes leaf is so important a factor in locating the bushes, there can be no question that the number of leaves on a bush, within certain limits, is a prime factor of its visibility. Any influence such as disease, insects, frost, etc., which reduces materially the number of leaves on a Ribes bush will therefore reduce its visibility. This point is generally understood, I believe, since it is for this reason that we stop eradicating along in September; but we are uninformed as to the progress of these defoliating agencies during the eradication season, and as to the degree of their effect on the visibility of Ribes. In other words, we do not know when defoliation begins to lower seriously the efficiency of locating Ribes by eradication crews or scouts.

This paper does not answer this question. It presents data bearing on this subject for the purpose of outlining the problem for thought, discussion, and further investigation. The data summarized here represent a small part of those available for use in this connection, but inspection of the balance fails to change materially the points this portion illustrates.

Plot 11, North Hudson Experimental Control Area, is one-half an acre in area, and was left untouched by eradication crews as a check plot. It is located in the heavily infected block of pine known as the Metcalf Area. In 1925 intensive examination showed that Ribes were present at the rate of 424 bushes with 2619.6 feet of live stem to the acre. No attempt was made to separate R. cynosbati from R. rotundifolium, the only two species on the plot, but I believe that most of the bushes were of the latter species, R. rotundifolium. Table 1 shows the distribution of these bushes among the live-stem size classes.

TABLE I Number of Ribes, arranged by live-stem size classes, on Plot #11 in 1925($\frac{1}{2}$ acre).

No live stem	$\frac{1}{2}$' (.1 to .7')	1' (.8 to 1.7')	$2\frac{1}{2}$' (1.8 to 3.7')	5' (3.8 to 7.5')	10' (7.6 to 17.5')	25' (17.6 to 37.5')	50' (37.6 to 75.0')	100' (over 75.0')	Total
1*	75	49	33	22	17	11	2	2	212

*A live root that sprouted and bore leaves in August.

In 1925, at intervals of two weeks, the leaves remaining on the Ribes of this plot were counted by careful observers. The live stem was measured and the leaves first counted on July 10, but since by that time slight defoliation had already occurred, notes were taken of its extent, and from these notes were obtained approximately the full-leaf figures for June 26. Subsequent counts were made on July 24, August 7 and 21, September 4 and 18, and on October 2, each date exactly two weeks later than the preceding one. On June 26 the 212 bushes on this one-half acre plot had a total of 22,782 leaves. Table 2 shows the relation between number of leaves and number of feet of live stem as of this date.

TABLE 2 Relationship between number of leaves and number of feet of live stem.

Live stem size class	Number of bushes ($\frac{1}{2}$ acre)	Total number feet of live stem	Total number of leaves	Average number of leaves per foot live stem
No live stem	1	.0	0	.00
$\frac{1}{2}$'	75	33.6	540	16.07
1'	49	59.0	786	13.32
$2\frac{1}{2}$'	33	86.2	1240	14.39
5'	22	114.2	1634	14.31
10'	17	210.8	2953	14.01
25'	11	297.9	4548	15.27
50'	2	76.6	950	12.40
100'	2	431.5	10131	23.48
Totals	212	1309.8	22782	17.39

It is evident that the variation in the number of leaves coincides very closely with the variation in the number of feet of live stem, with the exception of the 50' and the over 100' live-stem classes, representated by but two bushes each. With these classes omitted (they are unimportant in this consideration), the range of average leaves per foot of live stem is from 16.07 to 13.32, with no regular influence of size on the average number of leaves per foot live stem showing up within this range.

The total number of leaves remaining on the bushes of Plot 11 on each date is given in Table 3.

TABLE 3 Total foliation of the 212 bushes on plot #11 at 2-week intervals in 1925

Date	Number of leaves on 212 bushes	Per cent of total foliation
June 26	22,782	100%
July 10	22,619	99
" 24	14,851	65
Aug. 7	10,388	46
" 21	6,365	28
Sept. 4	4,179	18
" 18	2,667	12
Oct. 2	2,110	9

This shows a startling reduction in number of leaves beginning in early summer. Since number of leaves varies very closely with number of feet of live stem, it is possible to determine number-of-leaves classes that can be substituted for number-of-feet-live-stem classes without material error for use in connection with efficiency of location. The limits of these number-of-leaves classes were determined roughly by multiplying the average number of leaves per foot of live stem for each size class by the live-stem figures marking the limits of the same live-stem classes. These figures were moved slightly for the purpose of assorting the same number of bushes in each leaf class as fell in each corresponding live-stem class, as closely as possible. The heading of Table 4 shows the limits thus obtained for the number-of-leaves classes, and the first line the number of bushes falling in each as of June 26.

TABLE 4 Number of bushes in each number-of-leaves class, reassorted at four-week intervals.

Date (1925)	0 leaves	1 to 10	11 to 24	25 to 55	56 to 110	111 to 250	251 to 600	601 to 1700	over 1700	Total
June 26	1	80	44	33	22	17	11	2	2	212
July 24	9	115	34	20	13	11	7	1	2	212
Aug. 21	30	133	22	12	6	3	4	2	0	212
Sept.18	59	125	16	4	2	4	2	0	0	212

It will be noticed that the assortment of bushes is practically the same as among the live-stem classes (Table 1).

In order to simplify the work of summary, data taken at intervals of four weeks only were used; that is, data taken as of June 26, July 24, August 21, and of September 18. Table 4 shows the changes in the assortment of bushes among the number-of-leaves classes on each of these dates.

The efficiency of eradication crews in locating Ribes has been found repeatedly to vary with the live-stem size of the bushes. This is illustrated by Table 5, which is based upon the results of a crew that worked in the North

Hudson region during June and July. From this illustration it is evident that standard efficiency of location is lowest in the smaller live-stem classes, rising rapidly with the increase in live stem until, in the 25' class, practically all bushes will be located by a good crew. On the basis of number of bushes found the average efficiency in this case if applied by size classes to Plot 11 is 74.27% while when based on the number of units of live stem found the efficiency is about 96%. For the purposes of this discussion it will be assumed that the data in Table 5 represent standard efficiency of location for crews working during a portion of the season when Ribes are in full leaf.

TABLE 5 Approximate percent of bushes in each live-stem size class that a trained standard crew located when Ribes were in full leaf.

No live stem	½'	1'	2½'	5'	10'	25'	50'	100'
0%	50%	80%	90%	95%	98%	100%	100%	100%

Since the Ribes on Plot 11 can be assorted into number-of-leaves classes that correspond very closely with the live-stem classes, we can substitute number-of-leaves classes for live-stem classes in this relationship with per cent of efficiency of location. Assuming that number of leaves is the governing factor of efficiency of location, and eliminating from consideration the influences of other factors, we have the per cent efficiency of location increasing with the increase in number of leaves on the bushes, or inversely, decreasing in number of leaves.

Now, by applying the figures for efficiency of location for each number-of-leaves class to the number of bushes in each corresponding leaf class at intervals of four weeks, we arrive at a new series of per cent efficiency of location for each date. The individual figures mean little, because of the

grossness of the method of obtaining them, but their trend does demonstrate a fact.

Table 6 shows the efficiency of location figures after each four-week interval for the bushes arranged according to their leaf class when in full leaf (as of June 26).

TABLE 6 Per cent of bushes in each original number-of-leaves class (assorted when in full leaf) that would be located by a standard crew at four-week intervals. Computations consider number of leaves as the only factor of visibility, and are based on the 212 bushes on Plot #11 in 1925.

Date (1925)	0 leaves	1 to 10	11 to 24	25 to 55	56 to 110	111 to 250	251 to 600	601 to 1700	over 1700	Average
June 26	0%	50.00%	80.00%	90.00%	95.00%	98.00%	100%	100%	100%	74.27%
July 24	0%	47.88%	54.32%	71.82%	86.14%	95.06%	98.36	100%	100%	64.07%
Aug.21	50.00%	40.12%	45.45%	51.21%	60.45%	72.94%	94.00	100%	100%	51.67%
Sept.18	0%	32.25%	35.91%	37.88%	52.73%	49.41%	79.00	91.50	99.00	40.85%

It will be seen that the greater drops in efficiency of location come in the more important leaf-classes (and correspondingly, in the more important live-stem classes).

Notice that the decrease in efficiency of location begins to be marked at the height of the eradication season, and that the decrease does not take place suddenly at the end of the summer.

Résumé

I have endeavored to show that:

(a) Defoliation of Ribes at North Hudson, N. Y., begins in late June and early July, and reaches startling proportions by July 24.

(b) The number of leaves, before defoliation starts, varies very closely with the number of feet of live stem; that there does not seem to be any regular influence of size class on the average number of leaves per foot of live stem;

and that therefore leaf classes can be substituted for live-stem classes.

(c) That the leaf class of Ribes in all live-stem classes is quickly reduced by defoliation as the season progresses.

(d) That efficiency of location decreases among the lower live-stem size classes, and that if we assume that number of leaves is the governing factor of efficiency of location and substitute leaf classes for live-stem classes, this efficiency decreases also with the lower leaf classes.

(e) That the reduction in leaf class of bushes in all live-stem classes, because of defoliation, undoubtedly reduces materially the efficiency of location as defoliation progresses.

(f) That this defoliation is not abrupt at the end of the summer, but rapidly becomes serious at the peak of the eradication season.

Discussion

Dr. Metcalf: To what degree is defoliation collated with infection?

Mr. Fivaz: Data on this point are not summarized. Believes it is responsible for probably 80% of defoliation.

Dr. York: Have you collated progressive defoliation with climatic conditions?

Mr. Fivaz: Making a study at present time. Believes that bushes located in sheltered sites, where sunlight does not get at them, lose their leaves first.

Mr. Amadon: Is there any relation of size of bush to size of leaves, and size of leaves to efficiency in location?

Mr. Fivaz: Have no data on this. Own observations show size of bush has no bearing on size of leaves. Have developed leaf scale for measuring Ribes leaves.

Mr. Bradder: What bearing have these data on length of eradication season?

Mr. Fivaz: Nothing definite on account of localization of experiment. Suggests that each agent carry on similar experiment of his own by staking out at least 50 bushes and counting leaves at intervals during eradication season to determine degree of defoliation.

Dr. York: Do these data indicate that waves of heavy infection come from reduced amount of leaf surface?

Mr. Fivaz: Has no data. Believes infection of pine occurs chiefly in July and August.

Dr. Pennington: Yes - heaviest infection does occur in July and August.

Mr. Fivaz: Does not believe amount of leaves left at North Hudson in September would cause as much infection as in July and August.

Mr. Detwiler: Asks Dr. York if it is true that at North Conway, where Ribes were eradicated in July, infection took place that season.

Dr. York: It is, but that was an early season.

Mr. Filler: Asks what influence latitude and longitude might have.

Mr. Fivaz: Does not know. Altitude is high at North Hudson and infection heavy. Found good many Ribes defoliated in New Hampshire and Vermont in September. Skunk currants were found defoliated on the 24th of August at Warrensburg, N. Y.

Mr. Newman: Has observed, to some extent, that there are other factors besides infection which cause defoliation of Ribes. Defoliation was considerably earlier this year, and it is thought to be due to dry weather.

Mr. Fivaz: Interested to know results of observations made by New Hampshire men in this respect. Many Ribes put on second crop of leaves when defoliated early.

Mr. Pierce: Thinks Mr. Fivaz has shown necessity of field men knowing Ribes by all characters.

Mr. Fivaz: Learned a lot about characteristics of Ribes in winter by collecting 35 leaves with foot of snow on ground.

Mr. Cullen: Will finding of so many small bushes diminish the length of time before re-eradication?

Mr. Fivaz: Working on this subject at present. Growth of Ribes varies from year to year. Difficult to get data on growth of Ribes in short period. Has very good data for one year which was favorable for slow growth.

Mr. Fivaz: - (Discussion of Paper In answer to questions.)

It is probable that infection is responsible for the larger part of this early defoliation, since the most heavily infected bushes seem to be the first to lose leaves. Insects such as the so-called currant worm are responsible for a small percentage of the foliage loss on this area.

This defoliation is not a local phenomenon, as it has been observed in midseason in other places in New York State as well as in Vermont and New Hampshire. Early defoliation probably occurs wherever infection is general and the Ribes at least partly shaded, and will probably increase up to a certain point in any locality as the number of fruiting cankers increases.

Although no data are summarized to support this point, it has been my observation that direct sunlight is the important factor in governing leaf drop of individual bushes. Bushes exposed to direct sunlight are more slowly defoliated, and often the infection spots on such bushes apparently dry up and turn reddish.

It is impossible to get an accurate estimate of the extent of defoliation by inspection of bushes after the leaves start falling, because the bushes completely or largely defoliated can not easily be found. For this reason, by examining all Ribes we find on an area in September to ascertain leaf conditions, we get an incorrect impression of the extent of defoliation. Accurate information can be obtained only by re-examining periodically a sufficient series of staked bushes, first located when in full leaf.

The fact that early defoliation of Ribes affects the efficiency of their locating by eradication crews suggests the possibility of developing a characteristic of the genus other than the leaf as an identifying factor.

Perhaps Ribes could be readily recognized in their habitat by stem characteristics, but this possibility is slight under North Hudson conditions at least.

Knowing that early defoliation does affect efficiency of eradication work, we must determine in our own districts and under our own field conditions what is the maximum degree of defoliation consistent with efficient eradication work; and then, by periodically examining a representative series of marked bushes, determine just when this degree of defoliation is reached. By means of such a procedure we can continue the eradication period to its maximum length without chancing inefficient eradication near the end of a season determined merely by casual observation.

Scientific Investigations

By Haven Metcalf

Bureau of Plant Industry, U. S. Department of Agriculture

As I stated at the Washington conference two years ago at which many of you were present, I have considered research work on the life history of Cronartium ribicola essentially at an end in the East. Of course, an indefinite amount of further work could be done which would be of great scientific interest and value, but I do not believe that any further work on life history is likely to have any practical bearing on the control of the disease. Science is full of surprises and might surprise us in this case, but it has seemed best from the viewpoint of economical expenditure of funds to carry on further research work in this line in the West. All results obtained from this work, except those of purely local application, will be as applicable to the East as though done in the East, and expensive duplication of work is avoided.

Nevertheless, considerable time and money have been spent during the past year in working up, recording for publication, and publishing certain pieces of research the practical results of which were made available to you two or more years ago. Science is not merely knowledge; it is organized and recorded knowledge. It is not enough to obtain results and put them into practical use, but the method of obtaining the results must be made a matter of careful record for the sake of the scientists who follow with further research on the same or similar problems. As these publications are issued you receive notice in the Blister Rust News, and the following lists may to some extent duplicate what you already know. The following publications have been issued during 1926.

Boyce, J. S. Observations on white pine blister rust in Great Britain and Denmark. Journal of Forestry. Vol.24:893-896. December, 1926.

Spaulding, Perley, and Annie Rathbun-Gravatt. Longevity of the teliospores and accompanying uredospores of Cronartium ribicola Fischer. Journal of Agricultural Research 31: 901-916. November 25, 1925. (Issued January, 1926)

Spaulding, Perley, and Annie Rathbun-Gravatt. Influence of physical factors on the viability of sporidia of Cronartium ribicola. Journal of Agricultural Research 33: 397-433. September 1, 1926.

Spaulding, Perley. The white pine blister rust in Germany. Journal of Forestry. Vol. 24; 645-652. October, 1926.

The following manuscripts have been submitted for publication in the journals indicated and may be expected to appear during the coming year.

Boyce, J. S. Observations on foresty pathology in Great Britain and Denmark. (Phytopathology.)

Colley, R. H., M. W. Taylor and Carl Hartley. A comparison of the aeciospores and peridia of Cronartium ribicola and Cronartium occidentale. (Journal of Agricultural Research.)

Colley, R. H., and M. W. Taylor. Peridermium kurilense Diet. on Pinus pumila Pall., and Peridermium indicum n. sp. on Pinus excelsa Wall. (Journal of Agricultural Research.)

York, H. H., W. H. Snell, and Annie Rathbun-Gravatt. The results of inoculating Pinus strobus with the sporidia of Cronartium ribicola in 1921 and 1922. (Journal of Agricultural Research.)

The following manuscripts are on hand and some may be expected to appear during the coming year under the present or similar titles. Their publication will of course be announced in the Blister Rust News.

Hahn, Glenn G. A physiological method of distinguishing between Cronartium ribicola and Cronartium occidentale in the uredinial stage.

Hahn, Glenn G. Inoculation of Pacific Northwestern species of Ribes with Cronartium ribicola and Cronartium occidentale.

Lachmund, H. G. Method of determining age of blister rust infection on western white pine.

Lachmund, H. G. Studies of white pine blister rust in the West.

Lachmund, H. G. Late sporadic production of aecia by Cronartium ribicola in the Pacific Northwest.

Lachmund, H. G. Comparative resistance of the current season's needles of western white pine to infection by Cronartium ribicola.

Spaulding, Perley. Notes upon the white pine blister rust in Europe and upon conditions affecting its status there.

There is a possibility that some recent results which have been obtained in Washington may lead to the resuscitation of an old problem, namely, that of the overwintering of blister rust on Ribes by means of uredospores. You remember that Dr. York, Dr. Spaulding, and Miss Taylor found that in New England uredospores on dead leaves survived the winter in a viable condition. This appeared good presumptive evidence that such spores might inoculate young leaves of Ribes in the spring, but all attempts to inoculate very young leaves with either these overwintered uredospores or with fresh uredospores from the greenhouse failed, at least until the new Ribes leaves had obtained a certain maturity. There thus seemed to be a certain gap in our evidence of overwintering, since it seemed unlikely that uredospores on dead leaves would survive the conditions of early spring until such time as the Ribes leaves reached a stage of maturity that was apparently necessary for infection. Recently Mrs. Acree, in making inoculations in the greenhouse on Ribes kept in cold storage, has succeeded in inoculating both buds and the youngest leaves without apparent difficulty. It may be that the conditions of cold storage and the conditions under which the plants taken from cold storage unfold their leaves in the greenhouse are different from the conditions obtaining in the open, but it is certain that sooner or later we must duplicate these experiments in the open and try to account for these apparently contradictory observations. I do not see that the results from this experiment, however they ultimately turn out, will have any bearing on blister rust control in the East at this stage, but they may be of profound significance in the West.

In conclusion I want to express my gratitude to those of you who have supplied me with infected Ribes leaves for use in various research work. Some of you I notice have been faithful even unto ivy poisoning. Gratitude, you know, has been defined as a lively sense of favors to come.

S P E C I A L P A P E R S

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R E L A T E D S U B J E C T S .

SUBMARGINAL FARM LANDS IN NEW YORK STATE

By L. M. Vaughan

Instructor in Farm Management, New York State College of Agriculture

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To anyone traveling through the rural districts of New York State, it is at once apparent that decided changes in agriculture are taking place. The contrast between the valley regions and the hill sections, somewhat farther removed from the railroads, the main highways, and the cities, is quite striking. The reactions of various people to the apparently deplorable condition of these hill sections are considerably different. It is not the purpose of this paper merely to state that these areas exist, for the very nature of your work has made you familiar with them; but rather to give my reactions, with an attempt to explain the nature of these lands, why they are being abandoned, the result of this abandonment on the agriculture of the State, and what may best be done with these vast areas of idle land.

At the outset, it would be well to make clear the term "submarginal". Submarginal farm land is land that yields no rent. It does not pay for the costs of operation. If ownership is to be retained, it is more profitable to leave it idle than to work it. Land may be submarginal for one use and not for another; for example, it may be submarginal for crops and not for pasture. This is the situation on many farms, where the cropping of the valley land is accompanied by the pasturing of the hillsides. Land may be submarginal for one man and not for another, or with present methods and not with some other methods. Very excellent land may be submarginal in an occasional year. Quite often, land which is, in general, above the margin, may be out of use

because in some years it is submarginal, and people, basing their expectations on the recent past, think that it is poorer than it really is. Furthermore, after a few bad years, the owner may be unable to continue operations and may find it necessary to go elsewhere to earn money.

There are but few regions in which land is not occasionally out of use, following a few bad years, because of inability to operate it. On the other hand, land that is usually submarginal may be profitably used in some years. Land that is now submarginal may have been settled when it was above the margin. Houses, barns, and fences were put up and fertilizer applied. Crops and orchards may be in various stages of growth. With changing conditions this land may become submarginal, but operations may be continued while the improvements are being exhausted. The land itself is submarginal but the farm for a time may be above the margin. Much land that has been submarginal for some time is still occupied on this basis.

From the above, it becomes quite evident that land should not be classified on the basis of a single year or on errors in judgment. Land that, over a series of years, is on the average submarginal, is all that should be classified as submarginal land. There is some of this kind of land on most farms. There is an occasional farm composed almost entirely of this kind of land, situated among adjoining good farms. There are many farms grouped together in vast areas that are entirely of this same nature. It is this latter group that we are mostly interested in, and I would like to give a brief description of one of these areas that I was in this past summer.

This abandoned farm section, which is only one of many others, covers an area of about 6,000 acres and has an elevation ranging from 1,600 to 2,000 feet. The center of the area is only about four miles from a railroad on one

side and three miles from a macadam road on the other; but to get into it from any direction, long steep hills must be climbed. There are 69 pieces of property within this area. Of these, 6 are woodlots and 2 are parts of other farms. The remaining 61 make up as many separate farm units. All property is privately owned. Forty-nine of these 61 farms, or about 80 per cent, are vacant. Only 12 are occupied, and 3 of these men make no pretense to farm, but work out by the day.

The farms which are now vacant have been vacant for an average of about 14 years, while several have been vacant for over 50 years. On 18 of these vacant farms both the houses and the barns are gone. Only 14 of them have both a usable house and a usable barn. The remainder are either without one or the other, or with both unusable. There are no fences on 31 of the 49 farms, and it has been, on the average, nearly 10 years since any stock has been pastured. At present there are only 569 acres, in scattered lots, fenced and available for pasture. The feed is very poor. Only 121 acres are actually pastured.

It has been, on the average, about 8 1/2 years since any plowing has been done on these vacant farms, and an average of about 7 years since any hay was cut. There were 238 acres in crops in 1926, about one-half hay and the rest buckwheat and oats. The order in which these various activities were abandoned is about what one would expect. First, the people left, but the farms were still pastured until the fences were gone; crops were put in near the buildings until the fertility was gone; and finally, hay was cut until it was replaced by weeds.

It is often remarked that the owners of property which has been vacant for several years will discontinue paying taxes and allow the land to go back

to the State. In the regions in which I have been, I find this to be the exception rather than the rule. Land in New York State on which taxes amount to 5 or 10 per cent of its value, and which can not be rented, may still be sold for $5 to $10 per acre. Since taxes are only 50 cents to $1 per acre, the owner will continue to pay them, in the hope that he will be able to make a sale and to get back more than the amount of this year's taxes. With this in view, he may go on paying taxes year after year, for each time he only pays a small part of what he hopes to get back. The new buyer often repeats the process. Almost any farmer who has paid the taxes for several years would be glad to let the farm go, if he could get his taxes back; but he may still be willing to pay next year's taxes, and take a chance of being able to make a sale. This may go on indefinitely. The price has no relation to rental value or to value for crop production, nor is it held for rising prices. It is not unlike the holding of a useless horse. The owner may go on feeding him day after day, not because he brings in an income or because he expects a rise in price, but merely because he hopes to make a sale. The feed is only a meal at a time, and he may sell the horse for the value of a month's feed. This seems to me to be the chief reason why this land still remains in private ownership.

As far as farming is concerned, there was not much more being done on the 12 occupied farms than on the 49 vacant ones. There were 297 acres in crops and 142 acres pastured. The crops were the same as on the vacant farms. About one-half the crop area was in hay; the remainder was largely buckwheat, with some oats and a little fodder corn. The livestock on these 12 farms consisted of 25 horses, 24 cows, 2 heifers, 3 calves, 6 hogs, and 353 hens.

The average age of the farm operators was 50 years, and they had been

on these farms an average of 15 years. Only two of them were born in the region. About half of them had never farmed before coming into the area. There are no schools open within the area, and the six children of school age attend schools in adjoining districts.

In the fall of 1925 a preliminary study was made in this region by Mr. R. F. Bucknam of this Department. At that time there were 18 families living in the area. Only 8 of these were carrying on farming operations to any extent. The result of this study showed that these 8 farmers had on the average $56 for their year's work, in addition to a house and the farm products used in the house, after deducting 5 per cent interest on the capital invested. For the entire area, including the unoccupied land, the total gross sales were about $6,000, or 94 cents per acre. The value of the farm products used in the house amounted to an additional 48 cents per acre. Taxes, which amount to 39 cents per acre, take nearly one half the cash income. When taxes and other cash expenses are subtracted from gross sales, the remainder lacks about $2,100 of being enough to pay 5 per cent interest on the capital invested.

One rather questionable source of profit is through the repeated sales of these farms. Such sales are made on contract, the purchaser being required to make a substantial cash payment at the time of sale and to give a mortgage to the seller for the unpaid balance. All too frequently the purchaser finds it impossible to meet his interest payments, in which case the mortgage is foreclosed and the farm taken over by the original owner, who attempts to resell and thus obtain another cash payment. I have in mind one man in particular who has made this his speciality. He came into the region about five years ago and purchased a farm. Soon realizing that the farm was

worthless from an agricultural standpoint, he resold at the first opportunity, obtaining $1,000 in cash. The purchaser was unable to meet his interest payments, and the farm was back in the hands of the original owner within a year from the date of sale. He remained on the farm for two years and then resold, this time receiving a cash payment of $700. At the time the survey was taken everything pointed toward a second foreclosure. The unfortunate purchaser in such cases often loses the savings of a lifetime.

Those people who have accumulated enough money in some other region to pay for the entire farm in cash can, of course, stay longer; but it is only a question of time. For example, a man and his wife came into the region six years ago and bought 113 acres, which together with stock and machinery, cost him $3,100. The purchase of the farm absorbed the savings of a lifetime. A few years later he tried to borrow $500, offering the farm as security, but was unable to do so, despite the fact that he intended to purchase lime and a small flock of sheep with the proceeds of the loan.

It is commonly considered that all that is needed in such areas is thorough cultivation, the application of fertilizers, and some sort of livestock enterprise to make farming a success. The fact that the increase in expense may be all out of proportion to the increase in income is overlooked. Had this individual obtained the loan as asked for, the chances are it would only have meant the postponement of the time when he sould be forced off. As it was, he hung on for six years before leaving. He is now running a valley farm on shares. He is hoping to sell his farm for enough to take them back to the region from which they originally came. They are about 60 years old, too old to be starting out again. They now have an investment, not only yielding them no income, but costing them about $75 a year in taxes. I

could cite many more such instances.

So much for this area, but before leaving it I should like to outline it roughly in order that you may see it more clearly: 6,000 acres; 1,700 feet in elevation; 80 per cent of the farms vacant; 9 per cent of the area in crops; about 50 per cent of the land cleared and idle; buildings entirely gone on about one-third of the places and practically unusable on another third; fences nearly all gone. This is but one region. I could give you similar data from many others, but it is not necessary. You are all familiar with them.

I think we are now ready to ask the question, Why are these regions being abandoned? (1) The sale of timber from these farms for a number of years constituted a substantial part of the income. The timber crop has been harvested. (2) At the time these regions were settled, accessibility to market was not important, for most of the products were consumed at home. Today, however, production for sale is characteristic of our entire economic organization, and the necessity of going long distances to market adds considerably to the cost. There were no high-protein feeds, fertilizers, and lime to draw back up the hills in the earlier days. (3) Practically all of the work was formerly done by hand. These regions, in general, are not well adapted to the use of modern machinery. As a matter of fact, these never were very prosperous agricultural sections, as is evidenced by the size of the buildings.

What has happened to the agriculture of the State during the period in which the abandonment of these hill sections has been taking place? The number of farms and the area in farm lands reached a peak in 1880. By 1925 the number of farms had decreased 22 per cent and the area in farm land 19 per cent. There was a slight increase in the average size of farms.

Changes in number of farms and the acreage in farms in New York State

Year	Number of farms	Acres in farm land	Abandonment	
			Acres	Rate per year
1850	170,621	19,119,084		
1860	196,990	20,974,958		
1870	216,253	22,190,810		
1880	241,058	23,780,754		
1890	226,223	21,961,562		
1900	226,720	22,648,109		
1910	215,597	22,030,367	1,750,387	60,000
1920	193,195	20,632,803	1,397,564	140,000
1925	188,754	19,270,259	1,362,544	270,000
Total and average (45 years)			4,510,495	100,000

The above table shows that from 1880 to 1910 the rate of abandonment was about 60,000 acres per year. During the next ten years it more than doubled, reaching 140,000 acres per year; while during the last five years it practically doubled again, the abandonment during this period taking place at the rate of 270,000 acres per year. The total abandonment during this 45-year period was 4 1/2 million acres, or about 100,000 acres per year on the average. This does not include idle land on farms. If a farmer has a 100-acre farm and works only 5 acres of it, the entire farm is occupied.

At the same time that hill farms were being abandoned, total crop production was increasing, due to an increase in crop yields per acre.

AN INCREASE IN CROP YIELDS PER ACRE.

Comparative crop yields in New York state, 1866 = 100

Year	Yield	Year	Yield	Year	Yield
1866	100	1866	90	1906	107
1867	95	1887	90	1907	100
1868	87	1888	91	1908	101
1869	113	1889	97	1909	96
1870	100	1890	92	1910	112
1871	107	1891	94	1911	91
1872	103	1892	92	1912	104
1873	89	1893	95	1913	96
1874	104	1894	90	1914	107
1875	93	1895	80	1915	113
1876	92	1896	82	1916	117
1877	102	1897	107	1917	115
1878	108	1898	108	1918	109
1879	98	1899	91	1919	115
1880	93	1900	79	1920	112
1881	89	1901	97	1921	94
1882	94	1902	108	1922	114
1883	93	1903	102	1923	112
1884	93	1904	105	1924	119
1885	88	1905	106	1925	114

Taking the 5-year period 1880 to 1884 as a base for crop yields, and making the land in farms in 1880 equal to 100, the following table shows the compensating effect of these two factors on total crop production.

Index numbers of crop production in New York State

Year	Crop yields	Acres in farm land	Product
1880-1884	100	100	100
1906-1910	112	93	104
1916-1920	124	87	108
1921-1925	121	81	98

Because of extreme variations as between different years, the index of crop yields is computed on a 5-year basis. For example, the period from 1906-1910 showed an average increase of 12 per cent in crop yields over the average yields in the period 1880-1884. The acreage in farm lands in 1910 had decreased 7 per cent from the peak reached in 1880. The result of these changes on total production was an increase of 4 per cent. The period 1916-1920 showed an average increase of 24 per cent over the yields in the period 1880-1884, and by 1920 the acreage in farm lands had decreased 13 per cent from the peak reached in 1880. The total production was now 8 per cent greater than that which would have been obtained in 1880 based on the average crop yields of the period 1880-1884. The acreage in farm lands in 1925, because of the rapidly increasing rate of abandonment, had decreased 19 per cent from the peak in 1880. The total crop production decreased during this last 5-year period, but it was still practically as large as it was 45 years ago, in spite of the large abandonment of farm lands. The limit in this adjustment is not yet reached,

and it may be expected that more of the hill farms will go out of crop production. This is not an alarming situation, however, for as soon as prices indicate the need for increased production it will be easy to increase the yields on the good land of New York State by another 25 per cent.

Not only have we maintained crop production during these 45 years of abandonment, but milk production has been increased about 25 per cent. The abandonment of farm land, therefore, does not necessarily signify a decadent agriculture, any more than the abandonment of the old knitting mills meant a declining textile industry. It simply means that it is more economical today to increase production by using better methods on good land rather than to use poor land. The fact that these poor lands have been abandoned during a period of rising prices and general agricultural prosperity, and at a time when they were fully equipped, would seem to indicate that now, with the improvements exhausted, it is very doubtful if they will come back into use for crop production. A very large proportion of the lands in New York State above 1,500 feet in elevation are better adapted to trees than to other farm crops. In a region adapted to forestry but not to farming, if the region is broken up into farms the taxes often prevent collection of the land into areas suitable for forestry, and it may remain idle for a number of years. Were it not for taxes, a considerable part of it would be purchased in large holdings and reforested. I believe it would be better to have the land held by the State and kept for recreation and forest purposes.

When crops were scarce and trees so abundant as to have little value, the woodlands were burned to get crop land. Now that lumber must come from distant regions, the lands which are adapted to the growing of trees but that are not good for crops are going out of use as farm land. The adjustment is only natural.

Discussion

Mr. Frost: Was most of this land used for agriculture?

Prof. Vaughn: Yes. There was a time before abandonment when farms could be farmed with a profit.

Mr. Frost: In Maine some of the large lumber companies are buying up farms cheaply from older generation, and planting to trees.

Mr. Detwiler: Do you know that taxes are the factor that prevents people from reforesting tracts of land?

Prof. Vaughn: Yes.

Mr. Amadon: Asks Mr. Vaughn to state policy for remedy for this situation.

Prof. Vaughn: From study made, recommend that land is of no value for agriculture. Conservation Commission plans to take over some of this land and reforest it.

Mr. Amadon: Up to present time, Conservation Commission has arranged to take over 600 acres, at about $6 per acre, to be used for a bird sanctuary and reforestation. Survey was made to determine whether land was suitable for agriculture. Area is not within section set aside for forest preserve, and timber can be cut and sold.

Dr. Pennington: Doubts if it is entirely fault of unscrupulous real estate agents. Has studied bulletin published by the State with these farms listed. Wonders if State is taking steps to publish results of this survey.

Prof. Vaughn: Doesn't know that they are. Believes, usually, purchasers have no idea of conditions.

Dr. Pennington: Believes true conditions should be published by the State.

Mr. Clark: Locality which Mr. Vaughn describes is very similar to one in his district, which includes both hill and valley farms. If most of this land is taken up by the State, and taxes lost, what provision will be made for remaining owners? Tax problems, from a forester's viewpoint, do not consider school and other taxes.

Mr. Amadon: Believes State pays taxes on State lands.

Mr. Recknagel: State does pay tax on State lands in New York. Glad of interest shown by conference in subject of State taking over this land for reforestation. Several foresters unfavorable to this proposition. Let us do the growing, and our decendants will do the marketing.

FOREST MANAGEMENT BY PRIVATE OWNERS IN THE ADIRONDACKS

By A. B. Recknagel
Forester and Secretary, Empire State Forest Products Association

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The subject of forest management by private owners in the Adirondacks requires, first of all, a knowledge of the statistics. According to the war-time census[1] there are 171 owners of over 500 acres of timberland in the 11 counties comprising the Adirondack region. By ownership classes there are:

30 or 18%	owning	500 to 1,000	acres
83 or 48%	"	1,000 to 5,000	"
37 or 22%	"	5,000 to 25,000	"
18 or 10%	"	25,000 to 100,000	"
3 or 2%	"	over 100,000	"
Totals 171 or 100%	"	Total 1,816,307 acres.	Average 10,622 acres.

In the entire Adirondack region there are 4,600,000 acres of timberland, of which 1,865,450 acres are State Forest Preserve[2], leaving 2,834,550 acres of which about one million acres is in ownerships of less than 500 acres in size.

The significance of these facts was pointed out in the so-called Capper Report[3] namely, "that the State itself is the largest owner of merchantable timber..... 60% of the pulp timber in the State. The cutting of these lands is prohibited by the State constitution. The situation in New York is thus in striking contrast to that in Maine, where almost the entire supply of pulp timber is in private ownership."

The private owner in the Adirondacks is therefore a minority stockholder, both in area and in volume of timber held. He has, however, the strategic

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1/ The Forests of New York State. A. B. Recknagel. Macmillan, N. Y., 1923.

2/ Conservation Commission. 15th Annual Report, Albany, N.Y. 1926.

3/ U. S. Dept. of Agri. Forest Service. Report on Senate Resolution 311. Washington, D. C. 1920.

advantage of being able to operate his land, a privilege denied the State on its own land.

The 1,800,000 acres of Adirondack timberland in ownerships of 500 acres and upward occur in four main forest types, roughly distributed as follows:

74 per cent or	1,332,000	acres in	hardwood type
12 per cent or	216,000	" "	spruce flat type
12 " " "	216,000	" "	spruce slope type
2 " " "	36,000	" "	swamp type
Total	1,800,000	acres	

In these types the hardwoods have been but little cut. The spruce and balsam, however, have been logged since earliest days, first for sawlogs, later for sawlogs and pulpwood, and most recently for pulpwood alone. Thus forest management by private owners, often unconsciously, has been primarily directed at the softwoods. The spruce and the balsam today constitute the most important species, for they are the raw material for pulpwood, the chief timber crop of the Adirondacks.

A recently published bulletin of the U. S. Forest Service[4] gives the present stand of spruce and balsam in New York as 14,000,000 cords, of which 7,420,000 cords (53% instead of the 60% as in the Capper Report) are in the State Forest Preserve and 6,580,000 cords (or 47%) are on private land. The annual growth on these 6,580,000 cords is at a rate of 2.38%[5] or a total of 156,604 cords grown yearly.

According to strictly sustained yield forest management, the cut should not exceed the growth. Yet the cut of native New York spruce and balsam pulpwood in 1924 -- the latest year for which figures are available was 291,258

4/ U. S. Dept. Agri. Bul. 1241. Washington, D. C. 1924. Table 50.
5/ Amer. Paper & Pulp Assoc. Report of 48th Annual Convention. N.Y. City, 1925. Pp.71-72. Data from 1923 Growth Study on Finch, Pruyn & Co. lands.

cords[6], or nearly twice the annual growth.

It is therefore evident that forest management by private owners in the Adirondacks is falling short of the first test: Continuous production, or, as foresters put it, sustained yield management, in respect to the two chief softwood species, spruce and balsam[7].

The second test of forest management is in respect to production, and here the picture is brighter. The advantageous situation with respect to forest fires-- only 17/100 of 1% of the area burned in the last five years-- makes the young growth of spruce and balsam of great importance. Where fires have been kept out, due largely to the efficient forest protection by the State, the softwood types are regenerating satisfactorily to spruce and balsam.

An example based on recent (1926) field measurements by the Cornell Forestry Camp near Newcomb, N. Y., on lands belonging to Mr. R. C. Pruyn, of Albany, will serve as an illustration. This area was cut over in 1892 for spruce saw-timber to an approximate diameter of 10 inches on the stump. In 1923 it was logged again, this time for pulpwood. Spruce was cut to 9 inches on the stump and balsam to 7 inches. A carefully measured typical acre of spruce flat type showed, three years after logging, the following young growth present:

6/ U. S. Dept. Commerce. Forest Products: 1924. Wash., D.C. 1925. Table 5.

7/ That the balance between cut and production is favorable in the hardwoods was shown in an article on "New York Lumber Production - Present and Future," printed in the N.Y. Lumber Trade Journal, July 15, 1926.

	Spruce	Balsam	Others [1]
Trees 6 inc. diameter breast high and over	3	6	34
Trees 2 ins. to 5 ins.d.b.h. incl.	46	26	16
Trees over 1 ft. high but less than 2 ins. d.b.h.	1,176	1,632	745
Totals, per acre	1,225	1,664	795

1/ The "others" included cedar, yellow birch, red maple, and pin cherry.

In other words, the combined young growth of spruce and balsam on this typical acre comprised 2,889 trees. This is better than a 6 x 6 spaced plantation could do with its 1,200 trees per acre!

The management by private owners in the Adirondacks has, therefore, in respect to spruce and balsam, resulted in maintaining the forest. This has not, it is true, been accomplished by conscious, intelligent application of the principles of forestry, but by the reproductive capacity of the land itself, almost entirely unhampered by fire. There is no question that better results could and will be achieved in the future as the owners put into practice the principles of silviculture. In fact, these principles must be applied generally throughout the region if the future yield is to equal the annual consumption.

The way has been pointed by one of the most progressive of the big companies, and I can not do better in closing than to quote from the illuminating article by Austin Cary, veteran logging engineer of the United States Forest Service, in the "American Lumberman"[8], Mr. Cary is describing the operations of Finch, Pruyn and Company, Inc., of Glens Falls, N. Y.

8/ Modern Woods Methods Perpetuate Timber Supply. Austin Cary. American Lumberman, Chicago, Ill. Sept. 11, 1926.

"About twenty years ago, in fact, the management of this concern got clearly into its head the idea that it ought to be practicable through ownership and handling of a sufficient area of timber land to put its business in the way of perpetuity. Newsprint paper is a staple line and the demand for it seems likely to endure. Adirondack spruce and fir are especially well suited to its production; stocks of such timber in the United States were known to be fast diminishing. On that side the prospect seemed sufficiently promising and secure; at the timberland end of the scheme there was far less in the way of precedent and security. Nobody in this country had ever done exactly what they had in mind; not very much was known of the rate of growth of timber; the local fire situation of that time would have caused many men to shy off, for only beginning in 1909 did New York State enter on its course of organized fire protection. These men, however, quietly persisted.

"Two main moves they made at that time in harmony with the broad plan they cherished. First, realizing that if this was to be carried out on the scale contemplated they must own a much larger acreage of Adirondack timber land and not strip what they did own down to low-producing capacity, they bought stumpage in Canada sufficient to run their plant for about a decade. That was a good move in itself, one paralleled by many other companies. For them it had this special advantage-- that it gave them time and freedom to buy land and otherwise fix things up to their wish in their home territory. The second move referred to was the hiring, this in 1910, of a trained forester.

"Finch, Pruyn and Company are today owners of approximately 225,000 acres of Adirondack timber lands, along with minor, but still considerable, tracts in Vermont and Maine. Something like 15 per cent of this area is virgin timber with a heavy stand of spruce; a much larger fraction, cut over many years ago, has a very good stand indeed; other areas again, more lately

cut, are small in merchantable stand but nevertheless growing wood at a greater or less rate and valued accordingly. Hardwoods-- birch, beech, and maple-- are also native to the Adirondacks and stand on a large percentage of the lands of this company. This resource, by reason of quality and location combined, has only in small degree been utilized as yet; in fact, just at this time it constitutes a problem in respect both to utilization and silviculture. Relations of stand and yearly growth of wood to mill requirement will be treated later. Suffice it to say here that the company considers that when, three or four years from now, its Canadian stumpage has been exhausted it will be fully prepared to meet the situation.

"Regulation, especially the balancing of growth with requirement and technical problems involved in that, is one of the branches of systematic forestry, and these men, though they may have had little comprehension of the technical elaboration involved in foreign practice in that field, have always had a sure grasp of the essential idea.

"It is certain that, in spite of considerable cutting meanwhile, the lands owned in 1910 have more wood on them today than they had then, while the yearly growth of wood on lands owned is believed to approximate the annual mill consumption.

"We may justly, and should, derive stimulus and gain confidence from every such achievement among us. Forestry in a general way is recognized as a good thing, but men sometimes do not clearly apprehend it. From some representations it has been made to appear overtechnical and hard, too much for ordinary men; difficulties have been magnified while opportunity was overlooked; big, timely and attractive things have been clouded by a mass of detail.

"The men whose course has been recounted avoided all that. Accepting

indeed the help of history and precedent as they could, but placing main reliance on their own clear thinking, they went to considering their business situation and problems in true, independent American fashion. Others may do what they have done; in fact at just this time numbers of men seem to be going at it. Little doubt need be entertained of general success. Just as nowhere else in the world, perhaps, is fire protection more efficiently handled than in New York State today, so, given a few years, and we in this country stand in a way to put up a brand of forestry worthy of us, that will stand challenge from any quarter."

Discussion

Mr. Amadon: Asks Mr. Recknagel to give brief history of forestry in connection with founding of Cornell University.

Mr. Recknagel: Ezra Cornell, had secured white pine timber lands valued at 30¢ per acre, in Wisconsin. Operation of land began in 1890, under direction of Mr. Sage, of Albany. Value of white pine had risen from 30¢ per acre to $3 per thousand board feet stumpage. Title has now passed, with exception of few acres, to lumber companies. Foundation of Cornell University rests purely on white pine, as the funds for endowing it came from the operation of these white pine timber lands.

Mr. Fivaz: Remarks on restocking of planted pine and natural stocking; distribution has bearing. Because of localization of naturally seeded area, planted area thus favored. Climatic conditions during the past season account in part for small fire loss.

Mr. Cullen: Asks why State law prohibits cutting of timber on State lands.

Mr. Recknagel: Will give him reference for details, if he desires, after meeting closes. Law was passed because of serious abuses of permit. Largely done for protective measure, without regard for forestry practice. Clause has been amended to some extent, but not in regard to cutting.

THE BLISTER RUST CONTROL AGENT EXTENDS HIMSELF

By J. A. Cope
Extension Forester, New York State

I hope you like the title. Some time ago I prepared a memorandum concerning the subject of my talk at this conference, and sent it to my good friend Mr. Detwiler for comment and correction. I was rather unfortunate in my choice of title to this memorandum, for I called it "The Rôle of the Blister Rust Control Agent as an Extension Forester," so Mr. Detwiler came right back at me in very emphatic language to the effect that the blister rust control agent could not in any sense be considered as an extension forester; therefore the title gave an erroneous impression.

So I want to preface my remarks to you with the statement that I am thoroughly cognizant of the position of the officials at Washington on this matter, a position which under the premises they naturally must insist on. I, therefore, shall confine my remarks to drawing certain parallels between the extension forester's job and the blister rust control agent's job, and to pointing out some places where they dovetail, in fact, become almost indistinguishable the one from the other.

First, let me define my understanding of the word extension as it has come to be used by the agricultural colleges and extension service throughout the United States. It involves the presentation of known and accepted facts in regard to agriculture-- and this of course includes forestry-- to land owners (I use land owners rather than farmers to include woodland owners, who are, in some instances, a distinct group), with the object of having those facts incorporated in these owners' plans of land management. Perhaps this can be made a little stronger by saying "in such a way as to bring about their incorporation in these owners' plans of land management." You might have a head full

of facts and have worthy objectives in view, but the term extension involves something more than this; it involves the way subject matter is presented. Now, gentlemen, I ask you if under such a broad definition you are not extension specialists.

Let us consider, then, the ways in which these known facts are to be presented to bring about their adoption; in other words, the tools of extension. In this connection, if you have not already done so I commend to your attention the C. L. Pack prize article appearing in the Journal of Forestry for February, 1926, particularly the bibliography. This article is entitled "Public Relations in Forestry" and is written by Mr. John D. Guthrie of the Forest Service.

The first tool I would ask you to consider is the lecture. I am a firm believer in the lecture in the field of forestry extension. The subject matter of forestry more than any other in the whole field of agriculture lends itself to presentation by lecture, particularly the illustrated lecture. A great deal of informative and instructive material can be put across in an illustrated lecture, but remember extension means more than information and instruction; it means adoption, and the lecture alone will not in the field of forestry bring about the adoption of improved practices, because our farmers are not woods-minded. When the animal husbandry specialist lectures on improved feeding rations for stock, he talks in a language the audience understands, because they have been feeding stock all their lives; but when the forestry specialist talks about improved practices in the woods, he broaches a subject which this audience has probably never considered, and therefore they do not follow the line of presentation. As an attention-getter, as a means of arousing interest, as a basis of future contact, it is excellent. I feel that any specialist in the

field of forestry who does not make the lecture a means to an end rather than an end has missed a big opportunity.

Recently in connection with a tree-planting campaign in one of the counties in New York State, effective publicity measures were used to get out a large attendance to meetings. To crystalize the interest aroused by the speakers, cards were distributed all over the audience with the request that those who had idle land and were interested in tree planting should so indicate on the card. As a result a considerable number of contracts were thus made that might easily have been lost if we hadn't had the cards as a basis for follow-up work.

I think the same general statement applies to the window display or the exhibit at the county fair; attractive, informative, instructive they all are, and necessary, but simply as a means to an end, an opportunity to establish personal contacts.

There is the tool of publicity through the press. Its chief value, I would say, is publication of results accomplished. Bulletins are essential after interest is aroused, but not in arousing interest. But all these tools I have mentioned so far would never bring about the improved practices we desire, because they are of the classroom rather than the laboratory; we are bringing the forest to the owners by this artificial means, when what we must do-- because, as I have brought out before, our land owners are not woods-minded-- is to bring them to the forest.

This immediately calls to mind an entirely new set of tools -- the tour, the demonstration, the woods meetings, and finally the personal visit. The tour is becoming in New York State one of the most successful of tools for presenting tree planting to land owners. By this means 1,000 people were taken

to the woods in New York State this year, that is, to view plantations. Wherever possible on these tours or field days, an inspection of heavily-infected blister rust areas is combined with view of plantations. I think this a desirable combination that should be kept in mind in planning a tour. There is something rather spectacular or dramatic about visiting plantations that appeals to the crowd and gets a good turnout, and by taking advantage of this fact a bigger number can be shown the rust than if you attempted to run a blister rust tour alone.

You have already made splendid use of another extension tool, that is, the roadside demonstration. I don't see how any one can go by one of those striking displays that are to be found scattered through the Adirondacks without getting some inkling as to what it is all about. And just because of that subtle distinction between the lecture room and the laboratory already alluded to, I believe that a roadside demonstration has greater value than the same material carefully removed and skillfully displayed at a county fair or in a store window.

In regard to the woods meeting, that is, a method demonstration in which you demonstrate in the woods to a group of land owners, the methods by which the disease works and also the methods by which it is controlled, I hardly know what to say. This is a very successful tool in all lines of extension; in fact, it is the outstanding method which the specialist, with a State-wide territory to cover, must employ if his teaching contacts are to be at all commensurate with the time at his disposal.

Perhaps, as in the case of the tour, it would be better to combine demonstrations in blister rust control with a woodlot management or timber estimating meeting, such as have been carried on so successfully in Maine. And this brings

me to the last the most effective tool in the whole extension repertoire-- the personal visit.

Thus far, gentlemen, I think I have shown the extension forester and the blister rust control agent going along parallel lines using the same tools, applied. Each to his particular phase of the subject matter; but when it comes to the personal visit the parallel ceases; the two must converge and blend; their story and their message must be identical. An extension forester who goes into a man's woodlot, within the white pine area of the Northeast, to advise with him as to planting, management, and protection, and says nothing about blister rust control, is derelict in his duty; and conversely, if the blister rust control agent goes into a man's woods and talks only Ribes eradication, even granting that this is what he is paid for doing, he has somehow missed an opportunity to add one more convert to the slowly increasing body of farmers who are woods-minded, who regard their timber as a crop.

As I understand it, you are embarked on an 8-year program. This year 1926 marks the half-way point, an excellent time to take account of progress made; and I use the word progress advisedly, because it is nothing short of astounding, the progress that has been made. In practically every other line of plant, insect, or disease control, the Government stands the complete expense. In blister rust eradication the owner stands a good share of the expense if not all, and still these splendid results have been achieved. But let me remind you that it isn't the first four years, it is the next four years that are the hardest, because the cream has already been skimmed; the municipal and State jobs, the big companies, the large timberl nd holdings have been cleaned up, and you come down now to this owner of a small yet nevertheless important acreage. This non-woods-minded farmer that we have been talking about, he is the man that will be

your ever-present problem in the next four years.

Recently one of the blister rust control agents and I were talking about this phase of the problem, and just as a matter of interest, he got out his complete records of eradicated areas for 1925 and separated out those land owners who were dependent on the land on which they lived as a means of livelihood. That seemed to be a sufficiently clear definition of a farmer to suit our purposes. Numerically, this farmer class contained 30% of the cooperators, but on an acreage basis only 12% of the area eradicated. Incidentally, it might be well to interject at this point that according to census statistics, ownership from one-fourth to one-third of all the wooded area in the Northeast comes under this farmer group, so there is no escaping the issue. And so, to return to my original premise, it is because in the next four years you have to deal more and more with this farmer group that you must take advantage of these extension methods.

I have said that the personal farm visit is the tool par excellence of the extension specialist. Just last week the Director of Extension of New Jersey made the statement at Ithaca before all the extension men of the college that he considered next to the demonstration the farm visit the most effective teaching method in use in that State. It is terribly expensive, of course, and no specialist or group of specialists from a State institution could hope to have either the funds or the men to render anything like a 100 per cent service to farmers by the hundred thousand; hence the demonstration and field meeting. But in your case you have a limited territory, and in the 8-year period -- yes, in half that time -- you can actually visit every piece of woodland, interview every woodland owner in that territory. No one can ever accuse you of being one of these long-haired specialists from the college that comes down with a lot of theoretical stuff that has no practical bearing; you

are living right in the midst of these people with your feet on the ground.

Several years ago while patrolling the fire line in big fire in the Bitter Root Mountains, a nationally known figure in forestry circles who had been forest supervisor in three districts and professor in the college as well, told me that a ranger job where active timber sale was in progress struck him as being an ideal forestry job. He would have under his control a million or so acres where he could work out the ideals of his profession. It seems to me that you have a somewhat similar job, a restricted area, only you have a far more difficult item to deal with; namely, human beings on whom must be impressed entirely new viewpoints.

There is a good chance that all these tools of the lecture room that we have been talking about have not reached every woodland owner in your territory, and in such cases more thought must be spent on the proper approach, for it is indeed bad psychology simply to blow in on a man and announce that you are the blister rust control agent. A simple, dignified letter introducing yourself and mailed to reach him several days prior to your visit is an excellent way to make the first approach to the man you have not reached by these other extension methods. Perhaps still more effective is the use of local men who have already eradicated their woodlots and are thoroughly in accord with protection of pine.

The bringing about of improved practices is only one of the objectives of extension; the other and even more important objective is the development of local leaders. Many instances could be cited in other fields of agriculture where such leaders have been developed, through the county agent's efforts, to State-wide prominence; and so you will gather around you a group that will multiply the effectiveness in your work.

I can not emphasize too strongly how important is the matter of a sound appreciation of good forestry practices adapted to local conditions in this matter of personal approach. Never forgetting that you were hired by Uncle Sam to bring about an improved forest practice, that is, protection of white pine from blister rust, you will nevertheless be more than a blister rust control specialist, because the more avenues of approach to this woodland owner that you have at your command the more chances you have to get him to adopt this important practice. Do you walk through his hardwood area where he gets his fuel wood, then you will not fail to point out how he can improve this wooded area by removing weed trees, favoring crop trees, excluding stock. Does he have some valuable timber to sell, you will be able to tell him to whom and for what price he should sell it, because as you have gone around you will have gotten a knowledge of every wood-using industry in your territory and the prices paid for raw material. You will do these things and acquire this intimate knowledge not as ends in themselves but because they make additional avenues of approach to get across this improved practice, white pine protection. Then blister rust control takes its proper place in the plans of forest management, a protection measure to insure the pine crop as the spray insures the fruit crop.

In a small town in South Carolina they have erected a monument to the boll weevil because it was instrumental in bringing about diversified farming to the agricultural and financial betterment of the State. I submit, gentlemen, that when 1930 comes around we should seriously consider the erection of a monument to this "Peridermium" in the Northeast, because its presence made imperative the setting up of this great educational machinery which is the blister rust control organization, an organization which, without slighting in any degree the task for which it was created, did a far larger and more significant piece

of work. It brought about over a vast area in the northeastern United States the consideration of the forest as a crop, to be grown, cared for, protected, and harvested as any other crop.

Discussion

Mr. Newman: How frequently should indoor or outdoor meetings be utilized?

Mr. Cope: Tendency should be to hold meetings in conjunction with Extension Service, and thus dovetail projects.

Dr. York: Asks for explanation of organization of tours.

Mr. Cope: Adirondack forestry tour is now an annual event. People look forward to it. County agents arrange parties. Shown crew work in the field.

Dr. York: Believes the contacts made through tours are beneficial in conducting future educational work in agents' districts.

Closing Remarks

By S. B. Detwiler
Bureau of Plant Industry, U. S. Department of Agric lture

Expressed personal appreciation of vote of thanks by agents. Whole plan of meeting was based to give agents an opportunity to get each others' viewpoints and help to solve our common problem. Appreciation due New York men and Mr. Filler for the interesting program; also to the Chief of Bureau, who was instrumental in securing authorization for agents to attend the meeting.

The eight-year program bega in 1922 and is to run until 1930. Our object is to secure the protection of pine stands in the Northeast, not only now but in the future. Our work must be effective in training owners in eradication methods. We have done easier part of our job and our work is going to be increasingly difficult to the end of the program. On the other hand, with increased experience, it ought to counterbalance difficulties. It is up to agents to go back and put more punch and vigor into their work. The agents are doing a man's-size job; they make our contacts with the public and get the Ribes pulled. The success of the program depends on them. The results of the work thus far should make each agent feel proud of his part in the undertaking. It is the most successful effort in forest-disease control every undertaken.

Blister rust control work in the West is progressing very satisfactorily. This year Ribes were eradicated on approximately 9,000 acres in Idaho, at a cost of $1.26 per acre. Work hindered by bad fire season.

Would like agents to read Mr. Filler's paper[1/] presented at the Blister Rust Conference in Boston, February 8-10, 1923, and Mr. Detwiler's paper[2/] presented at the Boston Conference February 18-19, 1924, on cooperation in forestry subjects. Wants agents to help forestry work and be actively interested in it. Our funds are appropriated for blister rust control and must be spent for what the law specifies. Any work which is related to but outside of blister rust control must be approved by those administering the funds.

Wants agents' opinion regarding desirability of new one-reel film on blister rust, for agents' use.

Re-eradication

We must obtain more and better data on results of initial eradication. Need data for future plans and policy. Should include this phase of the work when making plans for next year.

1/ Rept. of Proceedings of 8th Ann. Blister Rust Conference, pages 37 to 41, Feb. 1923.

2/ Rept. of Proceedings of 9th Ann. Blister Rust Conference, page 12. Feb. 1924.

Miscellaneous:

Opinions regarding new film

Mr. Frost: Sees real need for new film in Maine. Thinks we should hold to blist rust idea.

Dr. York: Moves that each agent send his views on this subject to the Washington office, as soon as practicable, and not later than January 15. (All favorable.)

Mr. Detwiler: Would also like any other ideas regarding illustrative material, and a letter telling him whether they got sufficient out of the conference to repay for attending.

Mr. Filler: Describes revolving pine-tree exhibit. Use electric fan to blow streamers.

Dr. York: Tells of securing cooperation that day of judge of court (room conference held in) after seeing exhibits at the conference. Do exhibits pay?

Mr. F. J. Baker: Asks if there is possibility of office getting one of machines exhibited at banquet.

Mr. Detwiler: Yes, if it proves of general value. Would like suggestions along this line and frank opinions.

Chairman: Mr. Detwiler suggests we show our appreciation of the efforts of New York men in making this meeting a success.

Mr. Richardson: Moved that a committee, consisting of one agent from each State, be appointed to write letters of appreciation. (Carried)

Chairman: Requests Mr. Filler to appoint committee.

(Messrs. Hamilton, King, Nimman, Holden, Clark, Conner, and Brockway were chosen.)

Dr. York: Expresses appreciation of New York agents.

Mr. Newman: Expresses same sentiment for New Hampshire.

Mr. Sheals: Suggests we show our appreciation for Dr. Taylor's part in making it possible for agents to be present.

Chairman: Asks that resolutions committee write a letter of appreciation to Dr. Taylor.

Mr. Fivaz: Mr. Fogg, former blister rust agent, now county agricultural agent in Warren County, N. Y., sends his regret that he was unable to be present.

M I S C E L L A N E O U S

B U S I N E S S

Miscellaneous

Business

At this time Dr. York explained the various forestry and blister rust exhibits in the hall.

Mr. Sheals: Tells of Mr. Anderson's sickness and moves that the conference send him a message of sympathy.

Mr. Corliss: Moves that collection be taken up for flowers for Mr. Anderson.

(Unanimously carried)

Mr. Posey: Tells of experiment in use of string trail in West. Have found in analyzing experimental data that most discrepancies were due to improper marking of trail. Tried running compass lines and marking trail with paper and string. Latter seems to have advantages over paper. The trail is visible to most of the crew. Man marking trail is independent of crew. Under Idaho conditions, advantages of string trail offset cost. Haven't tried it out under eastern conditions.

Mr. King: How does it work out going through dense brush?

Mr. Posey: Fine. Man has string in box, attached to his back.

Mr. Pierce: String trail worked out very satisfactorily in Wisconsin in dense brush 4-6 feet high.

Mr. Conner: Expressed his appreciation and that of his fellow agents for being permitted to attend the conference. This was further emphasized by a rising vote of thanks.

Letters Read at Conference Dinner.

MASSACHUSETTS FORESTRY ASSOCIATION

4 Joy Street, Boston 9, Mass.

Dec. 2, 1926.

Mr. E. C. Filler,
Blister Rust Control,
Atlantic Ave.,
Boston, Mass.

Dear Mr. Filler:

I regret very much that I am unable to accept your kind invitation to give a talk at the blister rust conference on the subject of town forests. Our annual meeting conflicts with your conference and this makes it impossible for me to leave the city.

The conference may be interested to know that today we have 76 town forests in Massachusetts, and these do not include the areas owned for water supply protection, except in a few instances where the city or town has voted to establish a town forest on its watershed. If we were to count all of the forest lands owned by cities and towns as town forests, we would have 150 or more town forests which would cover an area of over 50,000 acres.

This movement has developed very rapidly in the past few years. Three years ago there were about 2,000 acres in Town Forests and today there are over 10,000, an increase of 500 per cent in the three years. At the present time, we have about 100 other towns with special committees that are studying the problem and will report at their town meetings.

In trying to interest the towns in blister rust work, I should think that the agent would naturally find out what forest lands the town owns, and in talking over the possibility of blister rust work on these lands with the town officials they have an excellent opportunity to put in an oar for town forests.

There are many cases in New England where poor-farms and other land is held by the town but in some cases the town hardly realizes that it owns these areas. Towns are nothing more than the assemblage of human beings, and the weakness of the town is very likely to be about the same as of the individual. We all have that feeling that is expressed in the cartoon "Keeping up with the Joneses", and if a town finds that its neighbors have gone into this movement of town forests, it is very likely to feel that it is

getting behind in the game if it does not do likewise itself. Hence in trying to put the town forest across in a given town we never fail to point out what its neighbors have done, and a glance at our map showing the location of town forests indicates that they have come in bunches, groups of three or four in one place, two or three in another and so on, and I am convinced that pointing out what the other towns have done is one of the most successful arguments that can be used.

So far as Massachusetts is concerned, we would welcome the cooperation of the blister rust agents in this work and we will be glad to furnish them with complete information as to the towns in their districts that have established forests and have committees looking into the problem.

I am sure that the agents have an opportunity here not only in advancing their work but they can be of great help in pushing the town forest idea.

Yours sincerely,

Signed (Harris A. Reynolds)

HAR:R Secretary.

STATE OF MICHIGAN

DEPARTMENT OF AGRICULTURE
L. Whitney Watkins, Commissioner
LANSING

November 24, 1926

Mr. J. E. Graf,
Acting Chairman,
Federal Horticultural Board,
Washington, D. C.

My dear Sir:

We have had several exchanges of letters relative to the white pine blister rust situation in Michigan.

Now, after having accompanied Mr. S. B. Detwiler through the New England States and seeing the blister rust at every turn, I think that I am fully convinced that there possibly is still some blister rust in Michigan. It seems hard for me to understand that with the very light infestation that we had in Michigan, that we should still have some here, but from all that I saw in the East, I can readily see that there is a great possibility that it has not been eradicated in Michigan.

I stated my attitude quite clearly to you and I know that a number of people in Michigan held the same opinion that I held, viz, that there was not any blister rust present in Michigan, as the infected trees had been removed and some very careful scouting had been done in the immediate vicinity.

There is no question in my mind but what the trip East sold me on the blister rust, and I am going to try and do some real work to find infected pines this winter, and we are going to work out a long-time project of some kind so that definite things can be done each year, and it is hoped that we can get a sufficient sum set aside in our budget to offset Federal aid and do some real constructive work in white pine blister rust control.

Very truly yours,

(Signed) E. C. Mandenberg
E

BUREAU OF AGRICULTURAL INDUSTRY
In Charge of Orchard and Nursery Inspection

ECM:BAB

Letters of Appreciation

Albany, N. Y.,
December 10, 1926.

Mr. C. R. Pettis,
Conservation Commission,
Albany, N. Y.

The blister rust control agents of the Northeast extend their sincere appreciation to the Conservation Commission of the State of New York for the splendid reception, intensively interesting program, and courteous manner in which they were entertained during the recent blister rust conference held at Albany. And furthermore, we wish to add our appreciation of your very personal efforts in our behalf at a time when you were pressed with important affairs of the Conservation Commission.

(Signed)

Stanley W. Hamilton (New York),
Thos. J. King (New Hampshire),
Solon D. Conner (Maine),
Ernest D. Clark (Connecticut),
H. J. Ninman (Wisconsin),
S. V. Holden (Vermont),
Earle M. Brockway (Massachusetts),

Committee on Resolutions.

Albany, N. Y.
December 10, 1926.

Dr. W. A. Taylor, Chief,
Bureau of Plant Industry,
Washington, D. C.

Throughout the busy hours of the annual blister rust conference, we, the undersigned committee representing all the blister rust control agents, have never ceased to appreciate the fact that "it was good for us to be here."

We feel that the meeting has been a real conference of inspiration and education, which will help us materially in securing the adoption of blister rust control practices by pine owners. We know the benefits derived from the conference will justify your action in making this meeting possible.

(Signed)

Stanley W. Hamilton (New York),
Thos, J. King (New Hampshire),
Solon D. Conner (Maine),
Ernest D. Clark (Connecticut),
H. J. Ninman (Wisconsin),
S. V. Holden (Vermont),
Earle M. Brockway (Massachusetts),

Albany, N. Y.,
December 10, 1926.

Dean A. R. Mann,
New York State College of Agriculture,
Cornell University,
Ithaca, N. Y.

We, the undersigned committee of blister rust control agents, representing all the agents present at the annual blister rust conference held at Albany on Decmeber 9 and 10, desire to express our sincere appreciation for the hearty cooperation of the Cornell representatives in attendance at this meeting. The talks of these men were most interesting and helpful, and should prove an inspiration in making our efforts more effective.

(Signed)

Stanley W. Hamilton (New York),
Thos. J. King (New Hampshire),
Solon D. Conner (Maine),
Ernest D. Clark (Connecticut),
H. J. Ninman (Wisconsin),
S. V. Holden (Vermont),
Earle M. Brockway (Massachusetts).

Albany, N. Y.,
December 10, 1926.

Dr. Haven Metcalf,
Office of Forest Pathology,
Bureau of Plant Industry,
Washington, D. C.

We, the undersigned, representing the blister rust control agents in the different States, wish to express our appreciation for the help we received from you and your assistants in presenting to us the results of further investigations of white pine blister rust. We wish you much success in your further work along these lines, and feel that no blister rust conference would be complete without your presence.

(Signed)

Stanley W. Hamilton (New York),
Thos. J. King (New Hampshire),
Solon D. Conner (Maine),
Ernest D. Clark (Connecticut),
H. J. Ninman (Wisconsin),
S. V. Holden (Vermont),
Earle M. Brockway (Massachusetts).

TELEGRAM TO MR. O. C. ANDERSON

Mr. Anderson, blister rust control agent for Rhode Island was unable to be present at the conference because of illness. The Conference voted to send Mr. Anderson the following message of sympathy and good will:-

TWELFTH ANNUAL BLISTER RUST CONTROL CONFERENCE

Albany, N. Y.,

December 10, 1926.

Andy,

Best wishes and good luck from the Blister Rusters to one of their own.

THE GANG

REPLY FROM MR. ANDERSON

506 Comstock Ave.,
Syracuse, N. Y.,
Jan. 3, 1927.

Dear Mr. Pierce,

I am writing you in the hope that you will be able to express through the News Letter the thanks I should like to convey to the Blister Rust men who sent me the candy, fruit, flowers, and potted plant from the last conference at Albany. I should like to be able to write all of them individually and thank each in person, for such an expression of good will from former associates as Dr. Pennington brought me really deserves better thanks than these faint words.

I've been feeling fine and frisky these days and the Doc says I'm on the mend, though not able to go skating next week.

Sincerely,

(signed) O. C. Anderson.

A T T E N D A N C E

Adams, Prof. Bristow	State College of Agriculture, Ithaca, N. Y.
Amadon, A. F.	Conservation Commission, Albany, N. Y.
Baker, C. E.	Saratoga Farm Bureau, Saratoga Springs, N. Y.
Baker, F. J.	C/o Farm Bureau, Keene, N. H.
Boomer, S. H.	C/o Farm Bureau, Conway, N. H.
Bowlby, I. S.	17 Pearl St., Hudson Falls, N. Y.
Bradder, W. E.	33 Temple St., Rutland, Vt.
Brockway, E. M.	106 Main St., Brockton, Mass.
Charlton, J. W.	Farm Bureau Office, Gloversville, N. Y.
Clark, E. D.	R. F. D. #1, Litchfield, Conn.
Cleve, William	Box 173, Gardner, Mass.
Cleland, Charles	Lewis, N. Y.
Conner, S. D.	904 Washington Ave., Woodfords, Me.
Cope, J. A.	Extension Forester, Cornell University, Ithaca, N. Y.
Corliss, J. M.	State Forestry Department, Concord, N. H.
Cox, W. P.	Bureau of Plant Industry, Washington, D. C.
Cullen, W. J.	C/o Farm Bureau, Rochester, N. H.
Detwiler, S. B.	Office of Blister Rust Control, Washington, D. C.
Doore, G. S.	Extension Service, Greenfield, Mass.
Endersbee, W. J.	81 Grove St., Great Barrington, Mass.
Filler, E. C.	Office of Blister Rust Control, Boston, Mass.
Filley, W. O.	State Agricultural Experiment Station, New Haven, Conn.
Fivaz, A. E.	Box 51, Warrensburg, N. Y.
Frost, W. O.	State Forestry Dept., Augusta, Me.
Hamilton, S. W.	31 Waters Terrace, Lowville, N. Y.
Harpp, N. H.	Warrensburg, N. Y.
Hastings, Smith	Lewis, N. Y.
Herr, C. S.	C/o Farm Bureau, Milford, N. H.
Hodgkins, L. W.	6 Anderson St., Taunton, Mass.
Holcomb, H.	Lewis, N. Y.
Holden, S. V.	Box 472, Burlington, Vt.
Kane, T. L.	C/o Farm Bureau, Woodsville, N. H.
Kennedy, J. D.	17 Pearl St., Hudson Falls, N. Y.
King, T. J.	C/o Farm Bureau, Concord, N. H.
Lambert, A. J.	C/o State Forestry Dept., Augusta, Me.
Littlefield, E. W.	Conservation Commission, Albany, N. Y.
Martin, Dr. J. F.	Office of Blister Rust Control, Washington, D. C.
McNerney, E. J.	19 Court St., Worcester, Mass.
Merrill, E. M.	
Metcalf, Dr. Haven	Office of Forest Pathology, Washington, D. C.
Miles, H. J.	Box 62, Putnam, Conn.

Newman, L. E.	State Forestry Department, Concord, N. H.
Nichols, B. H.	Lewis, N. Y.
Nimman, H. J.	State House, Madison, Wis.
Paige, R.	Lewis, N. Y.
Peabody, G. E.	State College of Agriculture, Ithaca, N. Y.
Pennington, Dr. L. H.	Syracuse University, Syracuse, N. Y.
Perry, C. C.	Room 136 State House, Boston, Mass.
Pettis, C. R.	Conservation Commission, Albany, N. Y.
Pierce, R. G.	Office of Blister Rust Control, Washington, D. C.
Posey, G. B.	Office of Blister Rust Control, Washington, D. C.
Recknagel, Prof. A. B.	State College of Agriculture, Ithaca, N. Y.
Richardson, G. F., Jr.	2 Billings Block, Lebanon, N. H.
Riley, J. E., Jr.	State Agricultural Experiment Station, New Haven, Conn.
Roop, W. T.	30 Paul Revere Road, Arlington Heights, Mass.
Rose, F. H.	Box 42, White River Jct., Vt.
Sheals, R. A.	39 Glendale Ave., Providence, R. I.
Spaulding, Dr. Perley	Northeastern Forest Experiment Station, Amherst, Mass.
Stevens, G. E.	Box 127, Lowville, N. Y.
Stimson, K. K.	Office of Blister Rust Control, Boston, Mass.
Strait, H. G.	Farm Bureau Office, Hudson, N. Y.
Swain, L. C.	C/o Farm Bureau, Exeter, N. H.
Taylor, Charles	State College of Agriculture, Ithaca, N. Y.
Vaughn, L. M.	State College of Agriculture, Ithaca, N. Y.
Wheeler, R. E.	719 Bridge St., West Springfield, Mass.
Williams, H. A.	3 Spring St., Oneonta, N. Y.
Woodward, E. G.	Warrensburg, N. Y.
York, Dr. H. H.	Conservation Commission, Albany, N. Y.